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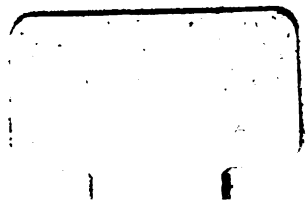

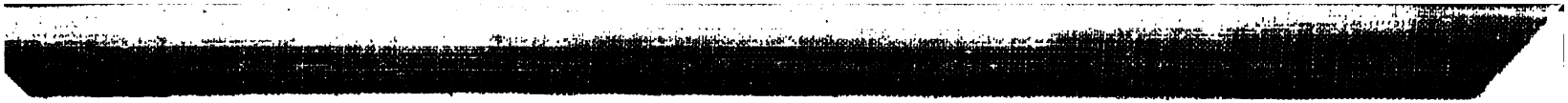

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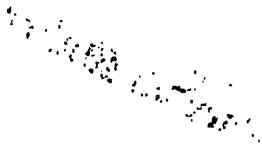

TABULATED RESULTS

—OF—

Siemon Muller

DISCHARGE OBSERVATIONS,

MISSISSIPPI RIVER

—AND ITS—

TRIBUTARIES AND OUTLETS,

1838-1894.

Compiled in the Office of the Secretary Mississippi River Commission.

Mississippi River Commission Print, 1895.

PREFATORY.

OFFICE OF THE SECRETARY, MISSISSIPPI RIVER COMMISSION;
July 25, 1895.

The observations for determining the discharge of the Mississippi River and its tributaries extend over a period of about half a century, and the results having been printed from time to time in various reports, it has been necessary heretofore to consult a large number of volumes in order to compare the different series of observations. The purpose of this compilation is to present in one book all known series of observations, arranged in convenient form for study and comparison.

Many details in the original publications, not thought essential to this object, have been omitted here for obvious reasons; but exact reference is given in every case to the originals, so that they may be consulted if desired.

The results for the Mississippi have been collected by stations, in order down the river, beginning at St. Paul, Minn., and ending at Head of Passes, La.

The tributaries have been placed in the same order, and stations on the Missouri, Ohio and Arkansas are also arranged beginning at the up-stream station; but on all the other tributaries the observations, being very scattering, have been collected by years. The crevasses on the main river are also collected by years.

The units of area and discharge for the Mississippi River from St. Louis down, and of the Ohio River, on account of the magnitude of the quantities involved, have been taken as 100 square feet and 1000 cubic feet respectively. The upper Mississippi and the other tributaries are given in square feet and cubic feet, as originally published.

Where it has been possible, all the stages for each station have been given in readings on a single gauge and the elevation of the gauge zero has been given with reference to the Cairo datum plane. This datum plane, to which all the precise levels of the Commission are referred, is an assumed plane 300 feet below the 9.16 foot mark on the

U. S. Engineer gauge at Cairo, Ill. The mean Gulf level at Biloxi, Miss., is taken, for the present, to read 21.26 feet above the Cairo datum plane; the final value of mean Gulf level will probably be about three-tenths foot lower than this value.

The distances given for the places on the main river have been scaled from the inch-to-mile maps, but many of the distances on the tributaries have been taken from pilots' tables, the latter are therefore regarded as only roughly approximate.

The mean depths given in the tables are obtained by dividing the water area by the width, except those given for Pine Bluff and for Columbus in 1879; in these two cases the mean depths are referred to assumed datum lines, instead of to the water surface.

With the above exception it is thought that the tables sufficiently explain themselves. It is intended that future observations may be added as supplements at the end of this volume and blank columns are left on the index sheet for those pages.

The accompanying map shows the relative positions of the various discharge stations.

GEO. A. ZINN,
Captain of Engineers, U. S. A.,
Secretary Mississippi River Commission.

TABLE I.—MISSISSIPPI RIVER.

Locations of observation stations with greatest and least discharges and stages.

Page.	LOCALITY.	Distance from Cairo.	MAXIMUM DISCHARGE.			MINIMUM DISCHARGE.			Highest known stage.		Lowest known stage.		REMARKS.
			Stage.	Date.	Disch'ge per sec.in 1000 cu.ft.	Stage.	Date.	Dis'h'ge per sec.in 1000 cu.ft.					
		miles.	feet.			feet.			feet.		feet.		
1	St. Paul, Minn	910	18.1	July 22, 1867	117	1.9	February 27, 1890	1	1881	19.5	1891	0.1	
8	Prescott, Wis	880	192.9	April 30, 1881	134	177 6	February 14, 1881	3	1881	‡18 0	1892‡	—0.7	‡ Hastings gauge.
12	Winona, Minn	785	446.5	October 15, 1881	127	433.6	December29, 1880	8	1880	450.5	1889	432.3	
16	Clayton, Iowa	668	17.6	October 10, 1881	179	0.4	January 1, 1881	16					
19	Burlington, Iowa	430	7.2	June 3, 1879	104	0.7	October 4, 1879	28	1870	15.0		0.0	
20	Hannibal, Mo	322	88.2	April 29, 1881	273	72.4	January 28, 1881	22	1868	91 6	1890	68.2	
22	Grafton, Ill	220	33 2	April 27, 1881	337	14.1	January 11, 1881	25	1892	37 3	1857	11.5	
25	St. Louis, Mo	181	35.2	May 21, 1892	1146	8.0	January 27, 1881	45	1844	41 4	1895	—0.4	
28	Cairo, Ill	0	49.6	1858	1420	2.9	November 11, '91	114	1883	52 2	1871	—1.0	
29	Columbus, Ky	21	43.6	February 22, 1882	1603	5.5	October 16, 1858	129	1884	45.8	1894	0.8	Belmont gauge.
39	New Madrid, Mo	70	37.9	May 8, 1893	1537	6.9	December 17, '88	215	1893	38.1	1894	1.7	
42	Point Pleasant, Mo	80	27.8	January 14, 1885	842	4.2	December 9, 1884	164	1884	¶41.5	1879¶	—0.2	¶ Morrisson Landing gauge.
43	Plum Point Reach	147-186	35.0	April 3, 1884	1520	2.8	November 11, '91	79	1882	36.7	1888	1.6	Fulton gauge.
49	Memphis, Tenn	230	35.5	March 20, 1890	1345	—1.4	November 8, '94	84	1890	35.6	1894	—1.4	
50	Hampton Ldg., Ark	242	26.4	January 24, 1879	838	6.0	May 28, 1879	236					
52	Helena, Ark	306	47.5	May 23, 1893	1594	1.0	November 7, '91	104	1886	48.1	1894	—2.2	
61	Old Town Bend	325				—2.2	November 8, '94	77	1886	48.1	1894	—2.2	Helena gauge.
62	Arkansas City, Ark	438	48.1	May 4, 1892	1742	7.4	December 13, '84	221	1893	50.3	1894	—2.4	
69	Greenville, Miss	478	28.1	April 19, 1894	740	—0.5	November 20, '94	104	1893	44.3	1894	—1.0	
69	Louisiana Bend, La	522				1.4	October 19, 1891	133	1892	41.9	1894	—4.2	Lake Providence gauge.
70	Wilson Point, La	531	40.8	May 24, 1893	1452	0.8	October 29, 1892	140					
	Lake Providence, La	542							1892	41.9	1894	—4.2	
76	Hays Landing, Miss	553	35.8	February 18, 1884	1195	6.2	October 17, 1882	201					
79	Vicksburg, Miss	599	46.9	June 24, 1858	1244	7.4	October 25, 1858	233	1890	49.0	1894	—5.3	
82	Warrenton, Miss	605	47.9	April 12, 1890	1324	4.8	December 15, '84	209	1890	49.0	1894	—5.3	Vicksburg gauge.
84	Waterproof Cut-off	663	40.7	May 25, 1884	839				1890	45.2	1894	—7.7	St. Joseph gauge.
85	Natchez, Miss	700	46.2	March 30, 1891	1525				1890	48 6	1872	0.0	
86	Red River Ldg., La	765	48.3	March 31, 1882	1595	1.9	November 21, '91	141	1892	48.9	1894	—0.2	
94	Carrollton, La	857	16.0	March 14, 1850	*1292	1.3	September 3, '80	225	1893	17.4	1872	—1.6	
104	At the Passes	1060		1838	810	0.4	September 10, '77	272	1893	17.4	1872	—1.6	Carrollton gauge.

Name of locality is also name of gauge unless otherwise stated. Crevasse discharges are printed on p. 155, et seq.

* The observation of February 26, reported unreliable, showed 1,422,000 cubic feet.

TABLE II.—TRIBUTARIES.

Locations of observation stations, with greatest and least discharges and stages.

Page.	RIVER.	LOCALITY.	Distance above mouth.	MAXIMUM DISCHARGE.			MINIMUM DISCHARGE.			Highest known stage.	Lowest known stage.	REMARKS.
				Stage.	Date.	Disch'ge per sec. in 1000 cu. ft.	Stage.	Date.	Disch'ge per sec. in 1000 cu. ft.			
			miles.	feet.			feet.			feet.	feet.	
109	• St. Croix	7 miles above Taylors Falls	56	‡ 7.0	May 13, 1882	86						
109	"	Prescott, Wis	0				L. W.	1879	8	1881 18.0	1892 −0.7	Hastings gauge.
109	• Chippewa	At mouth	0				0.7	September 27, '78	8			
110	• Wisconsin	Portage		2.8	October 19, 1879	10	−1.0	1886	2			
112	• Rock	Dixon					L. W.	October 11, 1870	2			‡ Above L. W.
112	Des Moines			H. W.	April 24, 1867	42						
113	• Illinois	LaSalle					L. W.	1867	1			
113	"	LaGrange		‡ 12.8	January 18, 1890	33	L. W.	1887	2			
113	"	Ottawa	283	5.2	July 16, 1889	17	0.6	October 24, 1889	1			
113	"	4 miles above mouth	4	19.3	April 26, 1881	39						Wheeler's Ferry gauge.
114	"	Peru	268	7.4	June 18, 1889	19	0.8	October 4, 1889	1			
116	"	Kampsville		‡ 9.2	June 22, 1889	32	−0.2	October 20, 1891	1			
116	Missouri	Sioux City	803	677.7	July 1, 1879	197	667.7	September 19, '79	18	1881 686.3	1892 663.2	
117	"	Omaha	668	558.0	July 11-12, 1882	135	551.6	October 10, 1879	15	1881 569.7	1876 517 9	
118	"	Nebraska City	609	505.4	June 28, 1878	240	497.2	September 26, '78	22	1881 509.4	9493.5	
118	"	St. Joseph	482	397.6	June 25, 1875	209	388 8	November 20, '75	29	1881 408.3	1878 377.3	
119	"	Atchison	446	369 1	July 3, 1882	224	355.9	November 29, '82	19	1881 376.5	1868 3 2.3	
120	"	Kansas City	396	3 7 3	June 24, 1888	370	309.2	September 20, '83	38	1844 341.2	1934 303.5	
121	"	St. Charles	25	28.6	July 3, 1879	291	6.3	February 20, '79	24	1844 39 5	1879 3.4	
124	Kaw	Kansas City	0	317.5	August 21, 1883	12	311.2	September 25, '83	2	1844 341.2	1884 303.5	
124	Gasconade	Above Round Island		7.0	November 14, '82	17	0.9	November 4, '82	1			Gauge was a temporary stake.
125	• Ohio	Pittsburgh, Pa	1021				0.0	1867-9	2			
125	"	Paducah, Ky	45	46.4	January 21, 1882	1233	3.1	November 3, 1882	54	1884 54.2	1894 −0.2	
129	"	Cairo, Ill	0				2.9	November 11, '91	42	1883 52.2	1871 −1.0	
129	Great Kanawha	Charleston, W. Va	50	34.6	January 16, 1878	155	L. W.	1888	1			
129	Elk	At mouth	0	35.4	January 16, 1878	88						Charleston gauge.
130	Kentucky	Beattyville					L. W.	1867-9	20			
130	• Tennessee	Chattanooga	487	30.0	April 11, 1892	228	3.0	November 18, '91	18	1867 58 0	1883 0.0	
130	Clinch		1				‡ 0.6	October 25, 1891	1			
130	Hiwassee		1				‡ 0.8	October 29, 1891	2			† Fulton gauge.
131	Hatchee	Near mouth					19.5	1858	7	1882 †36.7	1888 †1.6	‖ Below H. W. of 1858.
131	*St. Francis	Near mouth		‡ 1.0	March 8, 1883	373	26.1	February 27, 1858	21			‡ Below H. W. of 1882.
131	*St Francis Basin	Across St. L. I. M. & S. Ry		35 4	March 21-23, 1890	579				1891 35.6	1894 −1.4	Memphis gauge.
131	White	Below Cut-off		46.2	March 28, 1882	118				1890 50.4	1872 0.0	Mo. of White Riv. gauge.
132	"	Clarendon, Ark	184	38.8	March 10, 1893	202	6.8	June 20, 1879	6	1890 36 6	1887 4.1	
133	Arkansas	Fort Smith, Ark	431				5.4	January 24, 1887	3	1892 31 2	1879 −1.0	Little Rock gauge.
133	"	Little Rock, Ark	176	30.0	May 23, 1892	457	4.7	December 6, 1886	4	1892 31.2	1879 −1.0	
134	"	Pine Bluff, Ark	110	17.4	May 9, 1879	64	5.8	June 25, 1879	4	1892 35 6	1887 4 7	
135	"	Napoleon, Ark	0	44.6	June 5, 1858	148	4.6	November 4, '58	2			Delta survey gauge.

138	Yazoo	Various		46.5	March 18, 1884	161	17.0	November 17, '90	8	1890	49.0	1894	—5.8	Vicksburg gauge.
139	Old	Near mouth			March 20, 1851	102	30.6	July 20, 1880	—82	1892	48.9	1894	—0.2	Red Riv. Ldg. gauge.
141-6	*Red	Shreveport, La	317	35.0	May 30, 1892	228	—3.6	October 8, 1894	4	1892	35.7	1894	—5.5	
141-6	"	Alexandria, La	108	37.9	June 10, 1892	191	—1.8	November 19, '94	8	1892	38.2	1891	—3.7	
147	Loggy Bayou													
147	Black	Near mouth			February 4, 1856	56	2.4	October 30, 1894	8	1892	49 9	1894	—1.7	Barbre Landing gauge.
147	*Ouachita	Monroe, La	198	37 8	June 1, 1892	56	‡ 1.0	1872	1	1892	48.6	1887	—0.2	
147	Bayou Bartholo'w	Brown's Bridge		¶ 4.0	June 10, 1892	6								¶ Below H. W.
147	Amos Bayou	R. R across basin			1892	300								
148	* Atchafalaya	Simmsport, La	4	44.4	May 12, 1890	480	1.6	October 16, 1892	18	1892	46.6	1891	—1.6	
151	Bayou des Glaises			49.3	April 4, 1882	18								Barbre Landing gauge.
151	Bayou Plaquemine	Near head		¶ 1.2	April 11, 1851	33								
151	Bayou La Fourche	At head		21.6	February 21, 1890	32				1893	25.9	1894	—0.9	College Point gauge.

* Results obtained at other localities on this river are also tabulated.

ERRATA DISCHARGE PAMPHLET 1884.

Second page of Index, sixth line from bottom, should be Waterproof instead of "Waterproff."

Page 119—fourth line from top, Atchison, Kan , not "Kas."

Also, same on first page of Index.

INDEX.

[Index to earlier years follows this.]

LOCALITY.	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	189...	189...
Alexandria, La		141												143	145	146	146		
Amos Bayou													147	147	147	147			
Arkansas City, Ark							62	63		64		64	65	65	66	67			
Ashport Bend																	43		
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Bayou des Glaises					151														
Bayou La Fourche							151						151						
Black River														147		147	147		
Bullerton, Ark						44	44						44	44					
Burlington, Iowa		19																	
Cairo, Ill. (Miss. River)														28					
Cairo, Ill. (Ohio River)														129					
Carrollton, La		95	95			16	98	99				100	101	102	108	108			
Chippewa River	109																		
Clarendon, Ark		132													133	133			
Clayton, Iowa			16	16															
Clinch River														130					
Columbus, Ky		32		33	33									37	37	37			
¶ Crevasses					155	155	155						153	158	158	159			
Dekorra, Wis		110	110	110	110														
Elk River	129																		
Fulton, Tenn		45	45				48	48		48				48	48	48			
Gasconade River					124														
Grafton, Ill			22	22															
Great Kanawha River	129			129															
Greenville, Miss																	69		
Hampton Landing, Ark	50	50																	
Hannibal, Mo			20	20															
Hays Landing, Miss					76		78												
Helena, Ark		52			52		55	56			57	57	59	59	60	61			
Hiwassee River														130					
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Loggy Bayou																147			

¶ Crevasses of 1876 on page 155.

INDEX.—*Continued.*

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Louisiana Bend, La.														69					
Memphis, Tenn					49	49							49	49	49		49		
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St. Francis River						131	131												
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St. Paul, Minn	2	2	2				2	2	2			2, 3	2	3	5	7	7 b		
Tennessee River														130	130				
Warrenton, Miss.							82	82				83	84						
Waterproff Cut-off, La.							84												
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Winona, Minn			12	12															
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Yazoo River.						138	138						138	138					

† Previous to 1889 the sections were near the head of the river.

INDEX.—*Continued.*

LOCALITY.	1848	1851	1852	1856	1857	1858	1859	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875	1877	*
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Bayou Plaquemine, La.		151					151												
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Cairo, Ill. (Ohio River)					129														
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Dixon, Ill.												112							109
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Hatchee River						131										113			
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Kentucky River.									150	130	150								
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La Salle, Ill.									113										
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Passes, La.	104								110				110						
Pittsburgh, Pa.														141					
Portage, Wis.		141				111													
Red River.		86										112							
Red River Landing, La.														141					
Rock River.															148				
Shreveport, La.		148				148											118		
‡ Simmsport, La.						131													
St. Francis River.																			
St. Joseph, Mo.								25	1	2				25	25	2			
St. Louis, Mo.								1											
St. Paul, Minn.						79						115							
Vicksburg, Miss.													131						
Wheeling, W. Va.						131							110						
White River.									110										
Wisconsin River.						138										138			
Yazoo River.																			

For list of tributaries see Table II, ante. * Previous to 187 ; year not stated. ‡ Previous to 1869 taken above Simmsport.

MISSISSIPPI RIVER.

Mississippi River.—Saint Paul, Minn.

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1866.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Sept...24	2.5	.....	.....	.....	.....	.....	6,000	M	M = meter. F = double floats. R = rod floats.
1867.									
June...15	15.9	.....	.....	.....	.....	.....	71,884	F	
22	13.5	.....	.....	.....	.....	.....	54,220	F	
26	14.9	.....	.....	.....	.....	.....	64,392	F	Observations in 1866, 1867 and 1868 made under the direction of General Warren. (C. of E. 1887, page 1698.)
July... 1	17.0	.....	.....	.....	.....	.....	88,014	F	
5	14.8	.....	.....	.....	.....	.....	71,751	F	
8	13.4	.....	.....	.....	.....	.....	53,992	F	
10	12.6	.....	.....	.....	.....	.....	52,063	F	
12	11.6	.....	.....	.....	.....	.....	45,210	F	
15	10.2	.....	.....	.....	.....	.....	35,914	F	Gauge readings to 1886, inclusive, are from published record of U. S. Signal Service gauge at St. Paul. Elevation of gauge zero is 704.594 feet above the Cairo datum plane.
17	9.6	.....	.....	.....	.....	.....	34,183	F	
20	14.0	.....	.....	.....	.....	.....	73,150	F	
22	18.1	.....	.....	.....	.....	.....	117,450	F	
23	18.6	.....	.....	.....	.....	.....	110,552	F	
27	17.0	.....	.....	.....	.....	.....	89,725	F	
31	14.7	.....	.....	.....	.....	.....	65,186	F	
August 5	12.4	.....	.....	.....	.....	.....	52,776	F	All gauge readings tabulated herein for this station are referred to same zero.
10	10.2	.....	.....	.....	.....	.....	35,858	F	
14	9.3	.....	.....	.....	.....	.....	32,850	F	
20	8.8	.....	.....	.....	.....	.....	26,719	F	
28	7.8	.....	.....	.....	.....	.....	23,541	F	
29	6.4	.....	.....	.....	.....	.....	18,355	F	
Sept'r. 4	5.4	.....	.....	.....	.....	.....	13,414	F	
13	4.5	.....	.....	.....	.....	.....	9,316	F	
14	4.4	.....	.....	.....	.....	.....	10,055	F	
16	4.6	.....	.....	.....	.....	.....	10,156	F	
18	4.8	.....	.....	.....	.....	.....	10,700	F	
20	5.1	.....	.....	.....	.....	.....	12,460	F	
21	5.0	.....	.....	.....	.....	.....	12,960	F	
23	5.1	.....	.....	.....	.....	.....	11,892	F	
25	4.8	.....	.....	.....	.....	.....	11,784	F	
26	4.7	.....	.....	.....	.....	.....	11,110	F	
27	4.6	.....	.....	.....	.....	.....	11,697	F	
28	4.5	.....	.....	.....	.....	.....	11,000	F	
30	4.4	.....	.....	.....	.....	.....	10,357	F	
October 1	4.2	.....	.....	.....	.....	.....	10,274	F	
2	4.2	.....	.....	.....	.....	.....	10,082	F	
3	4.2	.....	.....	.....	.....	.....	9,813	F	
5	4.0	.....	.....	.....	.....	.....	9,708	F	
8	4.0	.....	.....	.....	.....	.....	9,870	F	
9	4.0	.....	.....	.....	.....	.....	9,785	F	
10	4.0	.....	.....	.....	.....	.....	9,636	F	
12	3.8	.....	.....	.....	.....	.....	9,270	F	
14	3.6	.....	.....	.....	.....	.....	8,921	F	
17	3.5	.....	.....	.....	.....	.....	8,353	F	
19	3.4	.....	.....	.....	.....	.....	8,528	F	
21	3.5	.....	.....	.....	.....	.....	8,262	F	
23	3.5	.....	.....	.....	.....	.....	8,267	F	
25	3.4	.....	.....	.....	.....	.....	8,108	F	
26	3.3	.....	.....	.....	.....	.....	8,046	F	
28	3.2	.....	.....	.....	.....	.....	7,816	F	
30	3.3	.....	.....	.....	.....	.....	8,440	F	
31	3.2	.....	.....	.....	.....	.....	8,122	F	
Nov'r.. 1	3.2	.....	.....	.....	.....	.....	8,317	F	
2	3.2	.....	.....	.....	.....	.....	8,455	F	
4	3.5	.....	.....	.....	.....	.....	8,606	F	
6	3.4	.....	.....	.....	.....	.....	8,695	F	
7	3.4	.....	.....	.....	.....	.....	8,712	F	
9	3.4	.....	.....	.....	.....	.....	8,654	F	
11	3.4	.....	.....	.....	.....	.....	8,601	F	
12	3.4	.....	.....	.....	.....	.....	8,412	F	
13	3.2	.....	.....	.....	.....	.....	8,402	F	
14	3.3	.....	.....	.....	.....	.....	8,331	F	
15	3.2	.....	.....	.....	.....	.....	8,293	F	

Mississippi River.—Saint Paul, Minn.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1867.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Nov....18	3.2	.....	.....	.....	.....	.....	8,217	F	M = meter.
19	3.2	.....	.....	.....	.....	.....	8,103	F	F = double floats.
20	3.2	.....	.....	.....	.....	.....	7,987	F	R = rod floats.
21	3.2	.....	.....	.....	.....	.....	8,075	F	
22	3.4	.....	.....	.....	.....	.....	8,229	F	
23	3.2	.....	.....	.....	.....	.....	8,073	F	
25	3.2	.....	.....	.....	.....	.....	7,877	F	
26	3.2	.....	.....	.....	.....	.....	7,742	F	
27	3.2	.....	.....	.....	.....	.....	7,560	F	
1868.									
March 4		.....	.....	.....	.....	.....			
6		.....	.....	.....	.....	.....			
10	†.....	.....	.....	.....	.....	.....	4,400	M	
18		.....	.....	.....	.....	.....			† Reading on Engineer's gauge given as 1.9 ft; meter under ice 2 ft. thick.
19	††	.....	.....	.....	.....	.....			
20	7.1	.....	.....	.....	.....	.....	9,564	M	
21	7 3	.....	.....	.....	.....	.....			
27	6.9	.....	.....	.....	.....	.....	19,156	M	†† Reading on Engineer's gauge given as 5.2 ft; meter under ice 1.3 ft. thick.
Aug....28	3.0	.....	.....	.....	.....	.....	8,380	M	
Oct....10	3.8	.....	.....	.....	.....	.....	10,249	M	
1874.									
Sept... 3	5.9	.....	.....	.....	.....	.....	20,091	.....	
25	4.3	.....	.....	.....	.....	.....	15,332	.....	Observations in 1874 made under direction of Col. Farquhar.
28	4.5	.....	.....	.....	.....	.....	15,516	.....	
1878.									
Oct....22	1.8	.....	.....	.....	.....	.....	6,218	.....	
1879.									
March 27	2 3	.....	.....	.....	.....	.....	4,307	F	Observations in 1878, 1879, 1880, 1884, 1885 and 1886 made under direction of Maj. Allen. (C. of E. 1887, p. 1698.)
28	1.4	.....	.....	.....	.....	.....	4,104	F	
1880.									
June... 9	11.0	.....	.....	.....	.....	.....	46,512	F	
1884.									
Aug... 23	2.9	.....	.....	.....	.....	.....	8,075	R	
1885.									
Sept... 26	3.6	.....	.....	.....	.....	.....	9,040	R	
Oct.... 9	3.1	.....	.....	.....	.....	.....	8,218	M	
Nov....18	2.7	.....	.....	.....	.....	.....	6,486	R	
23	2 3	.....	.....	.....	.....	.....	5,523	R	
28	2.0	.....	.....	.....	.....	.....	5,376	R	
1886.									
Aug... 3	2.4	.....	.....	.....	.....	.....	6,923	M	
14	2 0	.....	.....	.....	.....	.....	6,866	.....	
18	2.0	.....	.....	.....	.....	.....	5,024	M	
1889.									
Sept. a 20	2.2	.....	.....	.....	.....	.....	4,557	R	Signal Service gauge used.
a 21	2.2	.....	.....	.....	.....	.....	4,464	F	
a 23	2.3	.....	.....	.....	.....	.....	4,746	F	Observations made under direction of Maj. Jones. (C. of E. 1890, pp. 2101-2.)
a 24	2.4	.....	.....	.....	.....	.....	4,863	F	
a 26	2.0	.....	.....	.....	.....	.....	4,329	F	
Oct.. a 1	2.0	.....	.....	.....	.....	.....	4,244	F	
a 2	1.8	.....	.....	.....	.....	.....	3,771	F	a-Observations taken at Chestnut street.
b 5	1.9	.....	.....	.....	.....	.....	3,861	F	
b 7	1.9	.....	.....	.....	.....	.....	3,751	F	
b 8	1.9	.....	.....	.....	.....	.....	3,853	F	b-Observations taken at Hoffman avenue.
b 9	1.8	.....	.....	.....	.....	.....	3,891	F	
b 12	1.9	.....	.....	.....	.....	.....	3,969	F	
b 15	1.8	.....	.....	.....	.....	.....	3,761	R	
b 16	1.7	.....	.....	.....	.....	.....	3,961	F	
b 18	1.8	.....	.....	.....	.....	.....	3,650	R	
b 19	1.8	.....	.....	.....	.....	.....	4,113	F	
b 22	1.8	.....	.....	.....	.....	.....	3,889	R	
b 25	1.8	.....	.....	.....	.....	.....	4,035	F	
b 26	1.8	.....	.....	.....	.....	.....	3,980	F	
b 28	2.2	.....	.....	.....	.....	.....	4,644	F	
b 30	1.7	.....	.....	.....	.....	.....	3,718	F	
Sept..c 27	2.1	.....	.....	.....	.....	.....	4,194	F	
1890.									
Feb..c 4	1.9	.....	.....	.....	.....	.....	1,767	M	c-Observations taken at Pike Isl., above month of Minnesota River, including Ft. Snelling chute.
c 13	1.6	.....	.....	.....	.....	.....	1,583	M	
c 14	1.7	.....	.....	.....	.....	.....	1,584	M	
c 20	1.8	.....	.....	.....	.....	.....	1,571	M	
c 27	1.9	.....	.....	.....	.....	.....	1,489	M	

Mississippi River.—Saint Paul, Minn.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1890.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Mar. c 6	1.8	.....	.....	.....	.....	.....	1,573	M	M = meter.
c 13	1.8	.....	.....	.....	.....	.....	1,739	M	F = double floats.
c 20 21	1 9	.....	.....	.....	.....	.....	1,576	M	R = rod floats.
1889.									
Sept d 27	2.1	.....	.....	.....	.....	.....	4,481	F	Signal Service gauge used.
1890.									
Feb. d 14	1.7	.....	.....	.....	.....	.....	1,979	M	
d 20	1.8	.....	.....	.....	.....	.....	2,010	M	d-Sum of discharges Mississippi River at Pike Island and Minnesota River at mouth.
d 27	1.9	.....	.....	.....	.....	.....	1,927	M	
Mar. d 6	1.8	.....	.....	.....	.....	.....	1,939	M	
d 13	1.8	.....	.....	.....	.....	.....	2,225	M	
Oct..... 1	1.8	.....	.....	.....	.....	.....	4,533	M	
9	1.8	.....	.....	.....	.....	.....	4,100	M	Observations made under direction of Major Jones. (C. of E. 1891, pp. 2215-6.)
11	1.7	.....	.....	.....	.....	.....	3,939	M	
15	2.3	.....	.....	.....	.....	.....	4,789	M	
16	2.3	.....	.....	.....	.....	.....	4,789	M	
23	2.4	.....	.....	.....	.....	.....	4,996	M	Observations October 1, taken above Omaha Railway Bridge.
24	2.4	.....	.....	.....	.....	.....	4,896	M	
31	2.4	.....	.....	.....	.....	.....	5,085	M	
Nov. .. 1	2.3	.....	.....	.....	.....	.....	4,760	M	
7	2.1	.....	.....	.....	.....	.....	4,648	M	Observations taken above Robert street Oct. 9 to June 30.
26	1.3	.....	.....	.....	.....	.....	3,354	M	
28	1.4	.....	.....	.....	.....	.....	3,452	M	
1891.									
May.... 5	4.8	.....	.....	.....	.....	.....	10,160	M	
6	4.6	.....	.....	.....	.....	.....	10,358	M	
7	4.5	.....	.....	.....	.....	.....	9,330	M	
8	4.5	.....	.....	.....	.....	.....	9,154	M	
9	4.3	.....	.....	.....	.....	.....	8,634	M	
11	4.1	.....	.....	.....	.....	.....	8,360	M	
12	3.9	.....	.....	.....	.....	.....	7,919	M	
13	3 8	.....	.....	.....	.....	.....	7,502	M	
14	3.8	.....	.....	.....	.....	.....	7,520	M	
15	3.7	.....	.....	.....	.....	.....	7,424	M	
16	3.7	.....	.....	.....	.....	.....	7,503	M	
18	3.4	.....	.....	.....	.....	.....	6,935	M	
19	3.3	.....	.....	.....	.....	.....	6,591	M	
20	3.1	.....	.....	.....	.....	.....	6,192	M	
21	3.1	.....	.....	.....	.....	.....	6,433	M	
22	3.0	.....	.....	.....	.....	.....	6,311	M	
June... 4	2.8	.....	.....	.....	.....	.....	6,073	M	
8	2.6	.....	.....	.....	.....	.....	5,675	M	
9	2.7	.....	.....	.....	.....	.....	5,700	M	
10	2.7	.....	.....	.....	.....	.....	5,639	M	
11	2.6	.....	.....	.....	.....	.....	5,564	M	
12	2.5	.....	.....	.....	.....	.....	5,215	M	
13	2.6	.....	.....	.....	.....	.....	5,319	M	
15	2.6	.....	.....	.....	.....	.....	5,407	M	
16	2.8	.....	.....	.....	.....	.....	5,934	M	
17	2.8	.....	.....	.....	.....	.....	6,006	M	
18	2.8	.....	.....	.....	.....	.....	5,859	M	
19	2.8	.....	.....	.....	.....	.....	6,003	M	
20	2.8	.....	.....	.....	.....	.....	5,897	M	
22	2.6	.....	.....	.....	.....	.....	5,423	M	
23	2.6	.....	.....	.....	.....	.....	5,410	M	
24	2.7	.....	.....	.....	.....	.....	5,668	M	
25	2.6	.....	.....	.....	.....	.....	5,430	M	
26	2.4	.....	.....	.....	.....	.....	5,251	M	
27	2.6	.....	.....	.....	.....	.....	5,400	M	
29	2.8	.....	.....	.....	.....	.....	5,929	M	
30	2.7	.....	.....	.....	.....	.....	5,622	M	
May..§ 23	3.0	.....	.....	.....	.....	.....	6,175	M	§ Observations taken at Dayton Bluff.
§ 24	2.9	.....	.....	.....	.....	.....	6,101	M	
§ 26	2.9	.....	.....	.....	.....	.....	6,085	M	
§ 27	2.8	.....	.....	.....	.....	.....	5,950	M	
§ 29	2.8	.....	.....	.....	.....	.....	5,731	M	
§ 30	2.8	.....	.....	.....	.....	.....	5,875	M	
June. § 5	2.8	.....	.....	.....	.....	.....	5,854	M	
§ 6	2.8	.....	.....	.....	.....	.....	5,729	M	

Mississippi River.—Saint Paul, Minn.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1891.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
July....1	2.8	.....	.....	.....	.....	.....	5,773	M	M = meter.
2	2.9	.....	.....	.....	.....	.....	5,866	M	F = double floats.
3	2.7	.....	.....	.....	.....	.....	5,663	M	R = rod floats.
6	2.1	.....	.....	.....	.....	.....	4,858	M	
10	2.5	.....	.....	.....	.....	.....	5,420	M	Signal Service gauge used.
11	2.5	.....	.....	.....	.....	.....	5,163	M	
13	2.8	.....	.....	.....	.....	.....	5,690	M	Observations made under direction of Major Jones. (C. of E. 1892, pp. 1850-52.)
14	2.5	.....	.....	.....	.....	.....	5,373	M	
15	2.3	.....	.....	.....	.....	.....	5,046	M	
16	2.0	.....	.....	.....	.....	.....	4,621	M	
17	2.0	.....	.....	.....	.....	.....	4,662	M	Observations taken at Robert St. Bridge, from July 1, 1891 to June 30, 1893.
18	1.9	.....	.....	.....	.....	.....	4,575	M	
20	1.9	.....	.....	.....	.....	.....	4,948	M	
21	2.0	.....	.....	.....	.....	.....	4,696	M	
22	1.9	.....	.....	.....	.....	.....	4,597	M	
23	2.0	.....	.....	.....	.....	.....	4,688	M	
24	2.0	.....	.....	.....	.....	.....	4,732	M	
25	2.0	.....	.....	.....	.....	.....	4,676	M	
27	2.0	.....	.....	.....	.....	.....	4,516	M	
28	2.1	.....	.....	.....	.....	.....	4,861	M	
29	2.0	.....	.....	.....	.....	.....	4,787	M	
30	2.1	.....	.....	.....	.....	.....	4,809	M	
31	2.3	.....	.....	.....	.....	.....	5,259	M	
Aug... 1	2.1	.....	.....	.....	.....	.....	4,843	M	
3	1.8	.....	.....	.....	.....	.....	4,474	M	
4	2.0	.....	.....	.....	.....	.....	4,566	M	
5	1.8	.....	.....	.....	.....	.....	4,400	M	
6	1.8	.....	.....	.....	.....	.....	4,364	M	
7	1.8	.....	.....	.....	.....	.....	4,391	M	
8	1.9	.....	.....	.....	.....	.....	4,472	M	
10	2.0	.....	.....	.....	.....	.....	4,659	M	
11	1.7	.....	.....	.....	.....	.....	4,136	M	
12	1.5	.....	.....	.....	.....	.....	3,760	M	
13	1.5	.....	.....	.....	.....	.....	3,626	M	
14	1.3	.....	.....	.....	.....	.....	3,508	M	
15	1.5	.....	.....	.....	.....	.....	3,908	M	
17	1.5	.....	.....	.....	.....	.....	3,961	M	
18	1.6	.....	.....	.....	.....	.....	3,963	M	
19	1.3	.....	.....	.....	.....	.....	3,548	M	
20	1.9	.....	.....	.....	.....	.....	4,201	M	
21	1.7	.....	.....	.....	.....	.....	4,110	M	
22	1.5	.....	.....	.....	.....	.....	3,739	M	
24	1.4	.....	.....	.....	.....	.....	3,675	M	
25	1.6	.....	.....	.....	.....	.....	3,898	M	
26	1.5	.....	.....	.....	.....	.....	3,764	M	
27	1.5	.....	.....	.....	.....	.....	3,747	M	
28	1.3	.....	.....	.....	.....	.....	3,533	M	
29	1.2	.....	.....	.....	.....	.....	3,367	M	
31	1.5	.....	.....	.....	.....	.....	3,665	M	
Sept.... 1	1.5	.....	.....	.....	.....	.....	3,793	M	
2	1.5	.....	.....	.....	.....	.....	3,636	M	
3	1.4	.....	.....	.....	.....	.....	3,555	M	
4	1.3	.....	.....	.....	.....	.....	3,477	M	
5	1.3	.....	.....	.....	.....	.....	3,590	M	
7	1.7	.....	.....	.....	.....	.....	4,523	M	
8	1.5	.....	.....	.....	.....	.....	3,627	M	
9	1.2	.....	.....	.....	.....	.....	3,209	M	
10	1.2	.....	.....	.....	.....	.....	3,328	M	
11	1.4	.....	.....	.....	.....	.....	3,483	M	
12	1.1	.....	.....	.....	.....	.....	3,234	M	
14	1.6	.....	.....	.....	.....	.....	4,228	M	
15	1.3	.....	.....	.....	.....	.....	3,614	M	
17	1.4	.....	.....	.....	.....	.....	3,768	M	
18	1.3	.....	.....	.....	.....	.....	3,512	M	
19	1.2	.....	.....	.....	.....	.....	3,328	M	

Mississippi River.—Saint Paul, Minn.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1891.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Sept....21	1.2						3,245	M	M = meter.
22	1.4						3,539	M	F = double floats.
23	1.1						3,112	M	R = rod floats.
24	1.3						3,386	M	
25	1.3						3,288	M	Signal Service gauge used.
26	1.2						3,429	M	See notes on page 4.
28	1.5						3,679	M	
29	1.6						3,956	M	
30	1.6						3,894	M	
Oct.... 1	1.6						3,875	M	
2	1.7						3,932	M	
3	1.8						4,211	M	
5	1.6						3,999	M	
6	1.8						4,242	M	
7	1.4						3,606	M	
8	1.6						3,964	M	
10	1.5						3,824	M	
12	1.4						3,587	M	
13	1.5						3,809	M	
14	1.4						3,721	M	
15	1.4						3,761	M	
16	1.4						3,649	M	
17	1.3						3,458	M	
19	1.4						3,710	M	
20	1.5						3,831	M	
21	1.5						3,895	M	
22	1.5						3,781	M	
23	1.3						3,543	M	
24	1.2						3,540	M	
26	1.2						3,459	M	
27	1.5						3,693	M	
28	1.4						3,536	M	
29	1.4						3,659	M	
30	1.4						3,590	M	
31	1.3						3,612	M	
Nov.... 3	1.4						3,579	M	
4	1.1						3,193	M	
5	1.3						3,447	M	
6	1.1						3,190	M	
7	1.0						3,036	M	
9	0.8						2,686	M	
10	1.0						2,989	M	
11	0.5						2,423	M	
12	0.9						2,824	M	
13	0.6						2,508	M	
14	0.8						2,743	M	
1892.									
June... 1	11.4						39,478	M	
2	11.1						33,093	M	
3	10.8						35,548	M	
4	10.5						33,525	M	
6	† 9.0						29,304	M	† From Signal Service report.
7	9.6						31,150	M	
8	9.5						28,937	M	
9	9.2						28,033	M	
11	9.0						26,035	M	
13	8.7						24,478	M	
14	8.7						24,769	M	
15	8.8						25,799	M	
16	9.0						26,273	M	
17	9.5						28,933	M	
18	9.5						29,074	M	
20	9.8						31,183	M	
21	9.8						30,151	M	
22	9.6						29,474	M	
23	9.5						28,459	M	

MISSISSIPPI RIVER.—SAINT PAUL, MINN.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1892.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
24	9.0						26,243	M	M = meter.
25	8.8						24,899	M	F — double floats.
27	8.6						24,945	M	R = rod floats.
28	8.8						25,725	M	
30	8.6						24,128	M	
July... 1	8.3						22,788	M	Signal Service gauge used.
5	6.9						17,741	M	
6	6.8						17,096	M	
7	6.6						15,812	M	Observations made under direction of Maj Jones. (C. of E. 1893, pp. 2289-90.)
9	5.9						14,210	M	
11	5.5						12,574	M	
12	5.3						11,356	M	
13	5.0						10,623	M	Observations taken at Robert St. Bridge from July 1, 1891, to June 30, 1893.
15	4.7						9,472	M	
16	4.4						9,258	M	
18	4.8						9,852	M	
19	5.0						10,535	M	
20	5.0						11,100	M	
21	5.1						11,040	M	
22	5.2						11,782	M	
23	5.0						11,397	M	
25	5.0						10,586	M	
26	5.0						10,267	M	
27	6.4						15,686	M	
28	6.7						17,057	M	
29	6.4						15,729	M	
30	6.4						15,833	M	
Aug.... 1	6.4						15,672	M	
2	6.2						14,460	M	
3	6.0						14,132	M	
4	5.8						13,296	M	
5	5.7						12,886	M	
6	5.5						12,330	M	
8	5.4						11,741	M	
9	5.3						11,487	M	
10	5.2						10,744	M	
11	4.9						9,953	M	
12	4.8						9,956	M	
15	4.6						10,053	M	
19	4.0						8,601	M	
20	3.9						8,029	M	
22	3.7						7,744	M	
23	3.7						7,886	M	
24	3.6						7,384	M	
Sept... 8	3.6						7,607	M	
10	3.8						8,158	M	
13	4.2						9,270	M	
15	4.0						8,297	M	
17	3.6						7,567	M	
20	3.3						6,904	M	
22	3.3						7,005	M	
23	3.3						6,905	M	
24	3.3						6,881	M	
26	3.0						6,784	M	
27	3.0						6,465	M	
28	2.9						6,547	M	
29	3.1						6,669	M	
30	3.2						6,655	M	
Oct.... 1	3.2						6,812	M	
4	3.0						6,618	M	
6	3.0						6,483	M	
8	2.9						6,308	M	
11	2.9						6,363	M	
12	2.8						6,116	M	
15	2.7						5,930	M	
18	2.7						6,061	M	
19	2.6						5,623	M	

Mississippi River.—Saint Paul, Minn.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1891.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Sept....21	1.2	.....	.....	.....	.....	.....	3,245	M	M = meter.
22	1.4	.....	.....	.....	.....	.....	3,539	M	F = double floats.
23	1.1	.....	.....	.....	.....	.....	3,112	M	R = rod floats.
24	1.3	.....	.....	.....	.....	.....	3,386	M	
25	1.3	.....	.....	.....	.....	.....	3,288	M	Signal Service gauge used.
26	1.2	.....	.....	.....	.....	.....	3,429	M	
28	1.5	.....	.....	.....	.....	.....	3,679	M	See notes on page 4.
29	1.6	.....	.....	.....	.....	.....	3,956	M	
30	1.6	.....	.....	.....	.....	.....	3,894	M	
Oct.... 1	1.6	.....	.....	.....	.....	.....	3,875	M	
2	1.7	.....	.....	.....	.....	.....	3,982	M	
3	1.8	.....	.....	.....	.....	.....	4,211	M	
5	1.6	.....	.....	.....	.....	.....	3,999	M	
6	1.8	.....	.....	.....	.....	.....	4,242	M	
7	1.4	.....	.....	.....	.....	.....	3,606	M	
8	1.6	.....	.....	.....	.....	.....	3,964	M	
10	1.5	.....	.....	.....	.....	.....	3,824	M	
12	1.4	.....	.....	.....	.....	.....	3,537	M	
13	1.5	.....	.....	.....	.....	.....	3,809	M	
14	1.4	.....	.....	.....	.....	.....	3,721	M	
15	1.4	.....	.....	.....	.....	.....	3,761	M	
16	1.4	.....	.....	.....	.....	.....	3,649	M	
17	1.3	.....	.....	.....	.....	.....	3,458	M	
19	1.4	.....	.....	.....	.....	.....	3,710	M	
20	1.5	.....	.....	.....	.....	.....	3,831	M	
21	1.5	.....	.....	.....	.....	.....	3,895	M	
22	1.5	.....	.....	.....	.....	.....	3,781	M	
23	1.3	.....	.....	.....	.....	.....	3,543	M	
24	1.2	.....	.....	.....	.....	.....	3,540	M	
26	1.2	.....	.....	.....	.....	.....	3,459	M	
27	1.5	.....	.....	.....	.....	.....	3,693	M	
28	1.4	.....	.....	.....	.....	.....	3,536	M	
29	1.4	.....	.....	.....	.....	.....	3,659	M	
30	1.4	.....	.....	.....	.....	.....	3,590	M	
31	1.3	.....	.....	.....	.....	.....	3,612	M	
Nov.... 3	1.4	.....	.....	.....	.....	.....	3,579	M	
4	1.1	.....	.....	.....	.....	.....	3,193	M	
5	1.3	.....	.....	.....	.....	.....	3,447	M	
6	1.1	.....	.....	.....	.....	.....	3,190	M	
7	1.0	.....	.....	.....	.....	.....	3,036	M	
9	0.8	.....	.....	.....	.....	.....	2,686	M	
10	1.0	.....	.....	.....	.....	.....	2,989	M	
11	0.5	.....	.....	.....	.....	.....	2,423	M	
12	0.9	.....	.....	.....	.....	.....	2,824	M	
13	0.6	.....	.....	.....	.....	.....	2,508	M	
14	0.8	.....	.....	.....	.....	.....	2,743	M	
1892.									
June... 1	11.4	.....	.....	.....	.....	.....	39,478	M	
2	11.1	.....	.....	.....	.....	.....	38,093	M	
3	10.8	.....	.....	.....	.....	.....	35,548	M	
4	10.5	.....	.....	.....	.....	.....	33,525	M	
6	† 9.0	.....	.....	.....	.....	.....	29,304	M	† From Signal Service report.
7	9.6	.....	.....	.....	.....	.....	31,150	M	
8	9.5	.....	.....	.....	.....	.....	28,937	M	
9	9.2	.....	.....	.....	.....	.....	28,033	M	
11	9.0	.....	.....	.....	.....	.....	26,035	M	
13	8.7	.....	.....	.....	.....	.....	24,473	M	
14	8.7	.....	.....	.....	.....	.....	24,769	M	
15	8.8	.....	.....	.....	.....	.....	25,799	M	
16	9.0	.....	.....	.....	.....	.....	26,273	M	
17	9.5	.....	.....	.....	.....	.....	28,983	M	
18	9.5	.....	.....	.....	.....	.....	29,074	M	
20	9.8	.....	.....	.....	.....	.....	31,183	M	
21	9.8	.....	.....	.....	.....	.....	30,151	M	
22	9.6	.....	.....	.....	.....	.....	29,474	M	
23	9.5	.....	.....	.....	.....	.....	28,459	M	

Mississippi River.—Saint Paul, Minn.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1892.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
24	9.0	.....	.....	.....	.....	.....	26,243	M	M = meter.
25	8.8	.....	.....	.....	.....	.....	24,899	M	F — double floats.
27	8.6	.....	.....	.....	.....	.....	24,945	M	R = rod floats.
28	8.8	.....	.....	.....	.....	.....	25,725	M	
30	8.6	.....	.....	.....	.....	.....	24,128	M	
July... 1	8.8	.....	.....	.....	.....	.....	22,788	M	Signal Service gauge used.
5	6.9	.....	.....	.....	.....	.....	17,741	M	
6	6.8	.....	.....	.....	.....	.....	17,096	M	
7	6.6	.....	.....	.....	.....	.....	15,812	M	Observations made under direction of Maj. Jones. (C. of E. 1893, pp. 2289-90.)
9	5.9	.....	.....	.....	.....	.....	14,210	M	
11	5.5	.....	.....	.....	.....	.....	12,574	M	
12	5.3	.....	.....	.....	.....	.....	11,336	M	
13	5.0	.....	.....	.....	.....	.....	10,623	M	Observations taken at Robert St. Bridge from July 1, 1891, to June 30, 1893.
15	4.7	.....	.....	.....	.....	.....	9,472	M	
16	4.4	.....	.....	.....	.....	.....	9,258	M	
18	4.8	.....	.....	.....	.....	.....	9,852	M	
19	5.0	.....	.....	.....	.....	.....	10,535	M	
20	5.0	.....	.....	.....	.....	.....	11,100	M	
21	5.1	.....	.....	.....	.....	.....	11,040	M	
22	5.2	.....	.....	.....	.....	.....	11,782	M	
23	5.0	.....	.....	.....	.....	.....	11,397	M	
25	5.0	.....	.....	.....	.....	.....	10,586	M	
26	5.0	.....	.....	.....	.....	.....	10,267	M	
27	6.4	.....	.....	.....	.....	.....	15,686	M	
28	6.7	.....	.....	.....	.....	.....	17,057	M	
29	6.4	.....	.....	.....	.....	.....	15,729	M	
30	6.4	.....	.....	.....	.....	.....	15,833	M	
Aug.... 1	6.4	.....	.....	.....	.....	.....	15,672	M	
2	6.2	.....	.....	.....	.....	.....	14,460	M	
3	6.0	.....	.....	.....	.....	.....	14,132	M	
4	5.8	.....	.....	.....	.....	.....	13,296	M	
5	5.7	.....	.....	.....	.....	.....	12,886	M	
6	5.5	.....	.....	.....	.....	.....	12,330	M	
8	5.4	.....	.....	.....	.....	.....	11,741	M	
9	5.3	.....	.....	.....	.....	.....	11,487	M	
10	5.2	.....	.....	.....	.....	.....	10,744	M	
11	4.9	.....	.....	.....	.....	.....	9,953	M	
12	4.8	.....	.....	.....	.....	.....	9,956	M	
15	4.6	.....	.....	.....	.....	.....	10,053	M	
19	4.0	.....	.....	.....	.....	.....	8,601	M	
20	3.9	.....	.....	.....	.....	.....	8,029	M	
22	3.7	.....	.....	.....	.....	.....	7,744	M	
23	3.7	.....	.....	.....	.....	.....	7,886	M	
24	3.6	.....	.....	.....	.....	.....	7,384	M	
Sept... 8	3.6	.....	.....	.....	.....	.....	7,607	M	
10	3.8	.....	.....	.....	.....	.....	8,158	M	
13	4.2	.....	.....	.....	.....	.....	9,270	M	
15	4.0	.....	.....	.....	.....	.....	8,297	M	
17	3.6	.....	.....	.....	.....	.....	7,567	M	
20	3.3	.....	.....	.....	.....	.....	6,904	M	
22	3.3	.....	.....	.....	.....	.....	7,005	M	
23	3.3	.....	.....	.....	.....	.....	6,905	M	
24	3.3	.....	.....	.....	.....	.....	6,881	M	
26	3.0	.....	.....	.....	.....	.....	6,784	M	
27	3.0	.....	.....	.....	.....	.....	6,465	M	
28	2.9	.....	.....	.....	.....	.....	6,547	M	
29	3.1	.....	.....	.....	.....	.....	6,669	M	
30	3.2	.....	.....	.....	.....	.....	6,655	M	
Oct.... 1	3.2	.....	.....	.....	.....	.....	6,912	M	
4	3.0	.....	.....	.....	.....	.....	6,618	M	
6	3.0	.....	.....	.....	.....	.....	6,483	M	
8	2.9	.....	.....	.....	.....	.....	6,308	M	
11	2.9	.....	.....	.....	.....	.....	6,363	M	
12	2.8	.....	.....	.....	.....	.....	6,116	M	
15	2.7	.....	.....	.....	.....	.....	5,930	M	
18	2.7	.....	.....	.....	.....	.....	6,061	M	
19	2.6	.....	.....	.....	.....	.....	5,623	M	

Mississippi River.—Saint Paul, Minn.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1893.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
June... 2	9.1						27,635	M	At Robert St. bridge (continued.)
3	8.8						25,270	M	
5	8.4						24,051	M	
6	8.1						23,590	M	M = meter.
7	7.9						22,366	M	
8	7.7						21,073	M	Gauge readings are those of the U. S. Weather Bureau gauge whose zero is 704.594 feet above the Cairo datum plane.
9	7.4						20,452	M	
10	7.2						18,828	M	
12	6.8						17,718	M	
13	6 6						16,239	M	
14	6 3						15,168	M	
15	6.1						15,069	M	Observations and reduction 18-9-1894 under direction of Maj. W. A. Jones. Tabulation, 1894, in Report C. of E., 1894, p. 1733. A table and diagram of average discharge to gauge is also given, ibid. p. 1735.
16	5 9						14,090	M	
17	5 8						13,247	M	
19	5.4						12,188	M	
20	5.3						11,595	M	
21	5.2						11,617	M	
22	5.0						10,033	M	
23	4.9						10,079	M	
24	4.8						9,910	M	
26	4.8						9,604	M	
27	4.8						9,830	M	
28	4.7						9,256	M	
29	4.6						9,408	M	
30	4 4						8,716	M	
July... 1	4.2						8,089	M	
3	4 0						7,928	M	
5	3.9						7,858	M	
6	3.8						7,302	M	
8	3.8						7,086	M	
10	3.9						7,825	M	
11	4.0						7,597	M	
12	4.0						8,096	M	
13	4.0						7,935	M	
14	4.0						8,024	M	
15	4.0						7,669	M	
17	3.8						7,686	M	
18	3 7						7,159	M	
19	3.6						7,118	M	
20	3 4						6,748	M	
21	3.3						6,730	M	
22	3.2						6,024	M	
24	2.9						5,738	M	
25	2.8						5,870	M	
26	2.8						6,005	M	
27	2.7						5,608	M	
28	2.5						5,319	M	
31	2.4						5,676	M	
Aug.... 1	2.5						4,973	M	
2	2.3						4,674	M	
3	2.2						4,593	M	
4	2.2						4,631	M	
5	2.1						4,517	M	
7	2 0						4,491	M	
8	2.1						4,479	M	
9	2.0						4,327	M	
10	1.9						4,195	M	
11	1.8						4,293	M	
12	1.9						4,368	M	
14	2.2						4,957	M	
15	2.3						4,913	M	
16	2.4						5,192	M	
16	2.4						5,153	M	
17	2.3						4,814	M	
18	2.2						4,633	M	

Mississippi River.—Prescott, Wis.—Sec. 1 and 1a.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Feb.... 3	177.7	5,121	8.2	18.1	625	0.69	3,525	M	M = meter.
4	177.7	4,981	8.0	17.4	625	0.76	3,778	M	R = rod floats.
5	177.7	4,981	8.0	17.4	625	0 73	3 623	M	
7	177.7	4,981	8.0	17.4	625	0 69	3,4?2	M	Section 1 is above the mouth of St. Croix River.
8	177.7	5,046	8 1	18.0	625	0.71	3,604	M	
9	177 6	5,106	8.2	18.1	625	0.72	3,698	M	Section 1a is above Section 1.
10	177 6	5,146	8.2	18.1	625	0.72	3,694	M	
11	177 6	5,121	8 2	18.1	625	0 72	3,6 0	M	
12	177.6	5,015	8.0	18 1	625	0.71	3,554	M	Observations in Mch. were on Section 1a, others were on section 1. Report C. of E. 1883, page 2230.
14	177.6	5,056	8.1	18.1	625	0 68	3,418	M	
15	177 6	5,184	8.3	18 1	625	0 69	3 578	M	
16	177 7	5,241	8.4	18.3	625	0 71	3.715	M	
17	177.9	5,306	8.5	18 4	625	0.72	3.815	M	
18	177.9	5,306	8.5	18.4	6 5	0.73	3,886	M	The gauges at this station were established by the discharge observation party and the readings herein tabulated are corrected for thickness of ice.
19	178.0	5,331	8 5	18.4	625	0.69	3 661	M	
21	178 0	4,947	7.9	18.3	625	0.73	3,6 6	M	
22	178.0	4,955	7.9	18.4	6 5	0.79	3,950	M	
23	178.0	4,942	7.9	18.3	625	0.78	3.882	M	
24	178.0	4,950	7 9	18.4	625	0.78	3,862	M	
25	178.0	4,967	7.9	18.5	625	0.72	3.666	M	
26	178.0	4,975	8.0	18.5	625	0.72	3,613	M	The gauge zero is not connected directly with the Cairo datum, but by comparison with the Hastings gauge records, the Prescott gauge zero is approximately 514.6 ft. above the Cairo datum plane, without considering slope which is variable and probably less than 1 foot. Elevation of Hastings gauge is 690.79 feet above Cairo datum plane, from precise leveling.
March. 5	176.9	3,330	6.4	15.6	518	1.18	3,925	M	
7	176 9	3,266	6.3	15.4	518	1.24	4,059	M	
8	176 9	3,276	6.3	15.4	518	1 24	4.070	M	
9	176.9	3,284	6.3	15.4	518	1.24	4,068	M	
10	176.9	3,292	6.4	15.4	518	1.19	3,928	M	
11	177.0	3,289	6 4	15.4	518	1.26	4,150	M	
12	177.0	3,286	6.3	15.4	518	1.23	4,049	M	
14	177.0	3,314	6.4	15.6	518	1.16	3.855	M	
15	177.3	3,352	6.2	15 9	538	1.19	3,999	M	
16	177.3	3.387	6.3	16.0	538	1.19	4,037	M	
17	177.5	3,461	6.4	16.0	538	1.18	4,071	M	
18	177.5	3,460	6.4	16.2	538	1 20	4.138	M	
19	177 5	3,467	6.4	16.2	538	1.21	4,207	M	
21	177.5	3,452	6.4	16.2	538	1.23	4,236	M	
22	177.5	3,477	6.5	16.2	538	1.20	4,186	M	
23	177.7	3,512	6 5	16.3	538	1 20	4,199	M	
24	177.7	3,529	6.6	16 4	538	1.26	4,439	M	
25	177.9	3,569	6 6	16.3	538	1.24	4,407	M	
26	178.3	3,600	6.7	16 5	538	1.34	4,813	M	
July...22	183 4	9,050	12.8	20.9	708	2.41	21,831	R	
26	182 4	7,688	11.3	20.0	680	2.21	17,026	R	
27	182 2	7,588	11.2	20.0	678	2 17	16,483	R	
28	182 0	7,469	11.1	19.8	671	2.23	16,654	R	
29	181.2	7,432	11.0	19.5	675	2.10	15,636	R	
Aug.... 2	180.5	6,950	10.3	18.7	675	1.85	12,889	R	
3	180.4	6,900	10.2	18.8	675	1.73	11,983	R	
4	180.3	6,657	9.9	18.3	670	1 67	11,148	R	
5	180 2	6,205	9 3	18.4	670	1.74	10,811	R	
10	180.9	7,107	10 6	18.7	670	1.55	11,060	R	
12	180.8	6,808	10 2	18.3	670	1.60	10,937	R	
15	180.1	6,635	10 0	18.0	666	1.28	8,533	R	
16	180.1	6,727	10.1	18.1	666	1 33	9,000	R	
17	180 2	6,725	10.1	18.5	666	1.39	9,379	R	
18	180.4	6,667	10.0	18.7	666	1.48	9,898	R	
19	180 6	6,981	10.5	18.8	666	1.54	10,762	R	
22	181.9	7,977	11.8	19.8	676	1.66	13,312	R	
23	182.2	8,112	11.9	20.2	680	1.64	13.335	R	
24	182.2	8,118	11.9	20.5	680	1 59	12,931	R	
25	182.2	7,958	11.7	19.9	680	1.57	12,496	R	
29	183.2	8,799	12.6	21 3	680	1.46	12,889	R	
31	183 8	8,955	13.2	21.8	681	1 49	13.347	R	
Sept... 8	183.6	8,951	13.1	21.8	681	1.91	17,114	R	
13	188 9	20,636	.....	27.1	.....	.....	35,619	R	
14	189.2	20,707	.....	27.3	.....	.....	37,047	R	
19	189 3	20,358	.....	27.0	.....	.....	35,512	R	
20	189.0	20,434	.....	27.1	.....	.....	37,536	R	

Mississippi River.—Prescott, Wis.—Sec. 3.

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1880.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Nov.... 9	*3.6	8,181	.....	.....	.....	1.61	13,142	R	M = meter.
12	*4.0	8,604	.....	.....	.....	1.69	14,581	R	F = double floats.
19	*1.9	6,159	5.0	.....	1,230	1.38	8,597	R	R = rod floats.
Dec.... 14	178.0	6,338	5.2	7.8	1,230	1.24	7,882	M	
16	177.9	6,309	5.1	7.8	1,230	1.17	7,385	M	Section 3 is below the mouth of St. Croix River.
21	177.8	5,979	4.9	7.5	1,230	1.22	7,298	M	
22	177.8	6,102	5.0	7.5	1,230	1.19	7,252	M	
23	177.9	6,216	5.1	7.7	1,230	1.21	7,549	M	
24	177.9	6,175	5 0	7.7	1,230	1.18	7,318	M	See note on page 8 concerning gauge.
31	177.9	6,069	4.9	7.5	1,235	1.08	6,534	M	
1881.									* Temporary gauge.
Jan.... 1	177.8	5,945	4.8	7.4	1,235	1.11	6,589	M	
3	177.7	5,897	4.8	7.4	1,235	1 09	6,446	M	The presence of a slough at this station somewhat complicates the discharges since the slough is either full of dead water or dry at the lower stages. The slough discharge begins at about a stage of 186.5 feet, and at a stage of 190 3 feet on the gauge its discharge was 13,534 cu. ft. per second, observed Oct. 4, 1881. When the slough is discharging, the slough discharge and area are included in the tabulation, but the mean velocity and river width are omitted.
4	177.7	5,862	4.7	7.4	1,235	1.12	6,378	M	
5	177.8	5,947	4.8	7.4	1,235	1.09	6,506	M	
6	177.7	5,882	4.8	7.4	1,235	1.01	5,969	M	
12	177.7	5,841	4.7	7.4	1.235	1.10	6,452	M	
13	177.8	5,661	4.6	7.2	1,235	1.00	5,660	M	
14	177.8	5,759	4.7	7.3	1,235	1.24	7,115	M	
15	177.8	5,801	4.7	7.2	1,235	1.28	7,445	M	
17	177.7	5,812	4.7	7.2	1,235	1.16	6,752	M	
18	177.7	5,859	4.7	7.2	1,235	1.08	6,356	M	
19	177.7	5,832	4.7	7.2	1,235	1.22	7,100	M	
20	177.7	5,887	4.8	7.3	1,235	1.21	7,118	M	
21	177.7	5,907	4.8	7 3	1,235	1.09	6,454	M	
22	177.7	5,857	4.7	7.2	1,235	0.99	5,790	M	
24	177.7	5,882	4.8	7.3	1,235	1 04	6,148	M	
25	177.8	6,241	5.1	7.5	1,235	1.07	6,657	M	
26	177.8	6,051	4.9	7.4	1,235	1.10	6,664	M	
27	177.8	6.071	4.9	7.5	1,235	1.13	6,843	M	
28	177.8	6,055	4.9	7.5	1,235	1.14	6,780	M	
29	177.8	6,052	4.9	7.5	1,235	1.10	6,658	M	
31	177.8	6.235	5.1	7.4	1,235	1.08	6.797	M	
Feb.... 1	177 8	6,272	5.1	7.5	1,235	1.09	6,860	M	
March. 17	177.0	6,253	.....	.....	.....	1.14	7,152	M	
18	177.0	6,284	.....	.....	.....	1.11	6,962	M	
21	177.0	6,204	5.1	.....	1,223	1.13	7,009	M	
23	177.0	6.208	5.1	.....	1,228	1.15	7,113	M	
24	177.2	6,431	5 2	.....	1,228	1.26	8,131	M	
25	177 3	6,772	5.5	.....	1,228	1 21	8,483	M	
26	177.4	6,782	5.5	.....	1,228	1.26	8,569	M	
28	177.6	7,164	5 8	.....	1,228	1.34	9.587	M	
29	177.6	7,188	5.8	.....	1,228	1.38	9,947	M	
30	177.7	7,253	5.9	.....	1,228	1.50	10,849	M	
April.. 1	177.7	7,164	5 8	9.8	1,228	1 43	10,271	M	
2	177.7	7,251	5.9	9.2	1,228	1.44	10,405	M	
4	177 8	7,264	5.9	9.4	1,228	1.51	10,962	M	
5	177.8	7,246	5.9	9.2	1,228	1.57	11,361	M	
19	182.9	13,209	10 4	12.8	1,265	2.25	29,780	R	
20	183.7	13,761	10.9	13.8	1,265	2.38	32,768	R	
21	184.4	14,818	11.7	14.8	1,265	2.54	37,650	R	
22	185.0	.....	.....	.....	.....	.....	39,278	R	
23	185.6	16,625	13.1	16.2	1,265	2.64	43,901	R	
25	186.8	28.313	.....	17.5	.....	.....	52,676	R	
30	192.9	60,261	.....	.....	.....	.....	133,989	R	
May... 6	189.7	38,007	.....	20.8	.....	.....	77,956	R	
7	189.2	35,542	.....	19.6	.....	.....	75.000	R	
9	188 4	33,662	.....	18.5	.....	.....	65,108	R	
10	188.1	31,981	.....	18.2	.....	.....	60,739	R	
11	187 9	31,225	.....	18.2	.....	.....	56,891	R	
12	187.9	31,784	.....	18.0	.....	.....	58,793	R	
13	187.8	31,150	.....	18.0	.....	.....	57,567	R	
14	188.0	31,886	.....	18.9	.....	.....	61,725	R	
16	188.4	33,217	.....	18.9	.....	.....	63,899	R	
17	188.3	33,351	.....	18.9	.....	.....	63,319	R	
18	188.2	32,656	.....	19.1	.....	.....	61,601	R	

Mississippi River.—Prescott, Wis.—Sec. 3.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
May... 19	188.1	32,199	....	18.2	.....	.....	61,247	R	M = meter.
20	187.9	31,212	.....	18.1	.....	.....	58,331	R	F = double floats.
21	187.7	31,750	.....	17.8	.....	.....	56,189	R	R = rod floats.
23	187.2	29,903	.....	17.2	.....	.....	51,908	R	
24	186.8	28,265	.....	16.7	.....	.....	48,381	R	
25	186.5	27,066	.....	16.4	.....	.....	44,766	R	
26	186.2	17,306	13.7	16.1	1,265	2.46	42,590	R	
27	186.0	16,719	13.2	15.9	1,265	2.44	40,810	R	
28	185.6	16,425	13.0	15.3	1,265	2.36	38,822	R	
30	185.0	15,976	12.6	15.0	1,265	2.34	36,774	R	
31	185.0	15,818	12.5	15.0	1,265	2.35	37,202	R	
June... 1	185.4	16,199	12.8	15.1	1,265	2.34	37,936	R	
2	185.9	17,084	13.5	15.9	1,265	2.53	43,258	R	
3	186.1	17,214	13.6	16.0	1,265	2.51	43,326	R	
4	186.1	17,230	13.6	16.0	1,265	2.53	43,718	R	
6	186.6	27,015	.....	16.2	.....	.....	43,672	R	
7	186.6	27,096	.....	16.2	.....	.....	45,226	R	
8	186.5	26,670	.....	16.4	.....	.....	43,727	R	
10	186.1	16,786	13.3	15.7	1,265	2.34	39,277	R	
11	185.8	16,400	13.0	15.4	1,265	2.37	38,924	R	
13	185.3	16,054	12.7	15.2	1,265	2.39	38,435	R	
14	185.3	15,830	12.5	15.0	1,265	2.39	37,946	R	
16	185.6	16,106	12.7	15.3	1,265	2 47	39,828	R	
17	185.8	16,355	12.9	15.6	1,265	2.49	40,786	R	
20	186.4	25,966	.....	16.2	.....	.....	42,572	R	
21	186.4	25,941	.. ..	16.1	.....	.....	42,609	R	
23	186.4	25,901	.....	16.2	....	.....	41,917	R	
24	186.4	25,858	.....	16.1	.....	.....	42,146	R	
25	186.2	25,080	.....	16.0	.....	.....	39,352	R	
27	185.7	23,789	.....	15.4	.....	.....	38,742	R	
28	185.7	23,695	.....	15.4	.....	.....	38,017	R	
29	185.9	24,310	.....	15.4	.....	.....	40,092	R	
30	185.8	24,169	.....	15.7	.....	.....	39,444	R	
July... 1	185.4	23,183	.....	15.1	.....	.....	37,775	R	
2	185.2	22,530	.....	15.2	....	....	36,922	R	
5	185.2	21,998	.....	14.8	.....	.....	35,524	R	
6	184.5	20,117	.....	14.4	.....	.....	32,983	R	
7	184.2	19,115	.....	14.0	.....	.....	32,881	R	
8	183.9	18,083	.....	13.7	.....	.....	31,366	R	
9	183.5	16,809	.....	13.3	.....	.....	28,911	R	
11	183.0	15,059	.....	12.7	.....	.....	25,563	R	
12	182.7	14,049	.....	12.5	.....	.....	26,211	R	
13	182.4	13,050	.....	12.1	.....	.....	23,856	R	
14	182.4	13,140	.....	11.9	.....	.....	23,539	R	
15	182.6	12,250	9.7	12.4	1,265	1.97	24,169	R	
16	182.8	12,502	9.9	12 3	1,265	2.08	26,012	R	
18	183.0	12,758	10.1	12.8	1,265	2.08	26,599	R	
19	183.0	12,843	10.2	12.7	1,265	2.06	26,565	R	
21	182.8	12,436	9.8	12.4	1,265	1.99	24,827	R	
22	182.5	12,320	9.7	12.3	1,265	2.01	24,853	R	
23	182.3	11,859	9.4	12.0	1,265	2.01	23,920	R	
25	181.9	11,272	8.9	11.6	1,265	1.98	22,412	R	
26	181.7	11,087	8.8	11.5	1,265	1.95	21,724	R	
27	181.4	10,740	8.5	11.2	1,265	1.86	20,079	R	
28	181.1	10,525	8.3	10.7	1,265	1.82	19,168	R	
29	180.9	10,071	8.0	10.3	1,265	1.75	17,685	R	
30	180.6	9,889	7.9	10.4	1,258	1.73	17.100	R	
Aug.... 1	180.2	9,393	7.5	9.9	1,255	1.64	15,475	R	
2	180.0	9,008	7.2	9.6	1,255	1.73	15 614	R	
4	179.3	8,845	7.1	9.4	1,250	1.71	15,140	R	
5	179.8	8,753	7.0	9.5	1,250	1.60	14,070	R	
6	179.8	8,697	7.0	9.5	1,250	1 71	14,945	R	
9	180.5	9,390	7 5	10.1	1,250	1.85	17,400	R	
10	180.5	9,595	7.7	10.2	1,250	1.70	16,292	R	
11	180.4	9,285	7.4	10.0	1,250	1 73	16,070	R	
12	180.3	9,385	7.5	9.9	1,250	1.77	16,663	R	

MISSISSIPPI RIVER.—PRESCOTT, WIS.—SEC. 3.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Aug... 13	180 2	9,060	7.2	9.7	1,250	1.73	15,735	R	M = meter.
15	179.6	8,430	6.7	9.2	1,250	1.48	12,582	R	F = double floats.
16	179.5	8,271	6 6	9.1	1,250	1.57	13,016	R	R = rod floats.
17	179.6	8,290	6.6	9.2	1,250	1.58	13,102	R	
18	179.7	8,392	6.7	9.2	1,250	1.70	14,315	R	
19	179.8	8,555	6.8	9.2	1,250	1.71	14,681	R	
20	180 2	8,805	7.0	9.3	1,250	1.76	15,503	R	
22	181.2	10,442	8.3	10.7	1,265	1.82	19,070	R	
23	181.6	10,895	8 6	11.3	1,265	1.95	21,334	R	
24	181.7	10,985	8.7	11.3	1,265	1.93	21,204	R	
26	181.7	11,008	8.7	11.2	1,265	1.92	21,154	R	
27	181.7	11,050	8.7	11.3	1,265	1.88	20,821	R	
29	182.8	12,525	9.9	12.6	1,265	2.08	26,108	R	
30	183.6	13,505	10.7	13.5	1,265	2.08	28,124	R	
31	183.8	13,848	10.9	13.7	1,265	2.08	28,876	R	
Sept... 2	183.6	13,582	10.7	13.5	1,260	2.09	28,360	R	
3	183 6	13,505	10.7	13.5	1,265	2.03	27,385	R	
6	183.2	13,012	10.3	12.9	1,265	1.96	25,621	R	
7	183.0	12,890	10.2	12.9	1,265	1.96	25,320	R	
8	183.4	13,525	10.7	13.3	1,265	2 12	28,755	R	
9	184.3	14,135	11.2	13.9	1,265	2.15	30,461	R	
12	187 6	30,083	.....	17.5	.....	.....	56,115	R	
13	188 2	31,567	.....	17.8	.....	.....	58,475	R	
14	188.5	33,023	.....	18.3	.....	.....	62,242	R	
16	188 6	33,283	.....	18.0	.....	.....	60,854	R	
17	188.5	33,011	.....	18.2	.....	.....	61,245	R	
19	188.4	32,921	.....	18.1	.....	.....	61,153	R	
20	188.3	32,429	.....	18.1	.....	.....	58,227	R	
21	188.3	32,576	.....	18.1	.....	.....	60,860	R	
24	188.2	32,500	.....	18 1	.....	.....	57,932	R	
26	188.1	31,793	.....	18.0	.....	.....	55,874	R	
27	188.1	31,639	.....	18.0	.....	.....	56,628	R	
28	188.0	31,140	.....	17.9	.....	.....	53,970	R	
30	187.9	29,886	.....	17.9	.....	.....	53,802	R	
Oct.... 1	188.6	33,287	.....	18.5	.....	.....	61,861	R	
3	190.1	37,987	.....	20.2	.....	.....	80,875	R	
4	190.3	38,898	.....	20.3	.....	.....	84,443	R	
7	190.2	38,583	.....	20.4	.....	.....	79,027	R	
8	190.0	37,878	.....	20.3	.....	.....	80,367	R	
10	189.6	36,650	.....	19.9	.....	.....	70,413	R	
12	189.5	36,134	.....	19.8	.....	.....	70,792	R	
13	189.4	35,858	.....	19.6	.....	.....	67,358	R	
14	189.4	35,863	.....	19.6	.....	.....	70,879	R	
17	189.5	36,259	.....	19.8	.....	.....	74,546	R	
18	189.5	36,140	.....	19.9	.....	.....	74,788	R	
20	189.3	35,457	.....	19.5	.....	.....	69,496	R	
21	189.3	35,366	.....	19.6	.....	.....	70,705	R	
22	189.1	34,748	.....	19.3	.....	.....	67,246	R	
24	188.7	33,701	.....	19.1	.....	.....	65,179	R	

Mississippi River.—Winona, Minn.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1880.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Oct....26	435.9	9,130	6.2	10.2	1,476	2.32	21,186	R	M = meter.
27	435.9	9,290	6.4	9.8	1,443	2.12	20,659	R	F = double floats.
* 30	436.0	9,300	6.8	13.8	1,060	2.30	21,412	R	R = rod floats.
31	436.0	8,840	6.3	11.0	1,395	2.23	19,696	R	
Nov... 1	435.9	9,280	6.6	11.5	1,401	2.37	22,088	R	* Discharge taken at Homer, about four miles below regular section.
2	435.9	8,960	6.4	.....	1,401	2.20	19,668	R	
3	435.9	9,470	6.4	9.5	1,475	1.97	18,632	R	
4	435.9	9,280	6.3	10.0	1,481	2.23	20,722	R	
5	435.9	9,620	6.5	10.5	1,477	2 88	27,730	R	The gauge whose readings are tabulated for this station was established by the discharge party in 1880, and its zero was apparently 433. 63 feet below zero of present gauge on bridge at Winona, and 226.72 ft. above the Cairo datum plane.
6	435.9	9,300	6.3	9.5	1,479	2.28	21,288	R	
7	435.7	9,280	6.3	9.2	1,475	1.92	17,827	R	
8	435.7	9,040	6.1	9.2	1,479	1.96	17,712	R	
9	435.7	9,450	6.4	10.0	1,474	2.04	19,243	R	
12	436.3	9,960	6.7	10.2	1,480	2.49	24,793	R	
13	436.1	9,820	6.6	10.5	1,488	2.45	24,042	R	
14	436.1	9,780	6 6	10.0	1,489	2.39	23,359	R	
15	436.0	9,370	6.3	9.5	1,487	2 38	22 270	R	
Dec ... 8	434.6	8,270	5.8	9.4	1,433	1.06	8,797	M	The discharge section was reported by the observer to be about 1½ miles below the Chicago and Northwestern Railroad bridge at Winona, Minn.
9	435.1	9,300	6.4	10.0	1,452	1.22	11,300	M	
10	435.6	9,880	6.7	10.3	1,472	1.35	13,287	M	
11	435.7	9,950	6.8	10.6	1,473	1.46	14,544	M	
13	435.9	10,080	6.8	10.6	1,477	1.57	15,827	M	
14	435.8	10,070	6.8	10.8	1,478	1.58	15.881	M	
15	435.8	9,950	6.7	10.3	1,477	1.57	15,627	M	
16	435.7	9,800	6.6	10.2	1,476	1.56	15,305	M	
17	435.5	9,640	6.5	10.2	1,472	1.56	15,080	M	(Report C. of E. 1883, p. 2237.)
18	435.5	9,360	6.4	10.2	1,471	1.56	14,561	M	
20	435.4	9,100	6.2	10.1	1,472	1.53	13,960	M	
21	435.3	9,280	6.3	10.5	1,472	1.52	14,125	M	
22	435.2	8,920	6.1	9.8	1,472	1.53	13,622	M	
23	435.3	8,950	6.1	9.6	1,471	1.59	14,236	M	
24	435.2	8,950	6.1	8.4	1,471	1.54	13,817	M	
25	435.2	8.950	6.1	8.5	1,471	1 62	14,468	M	
27	435.2	8,650	5.9	7.9	1,463	1.45	12,579	M	
28	434.2	7,250	5.1	6.7	1,414	1 18	8,545	M	
29	433.6	6,480	4 6	6.5	1,418	1.21	7,845	M	
30	433.7	7,030	5.0	6.6	1,420	1.38	9,692	M	
31	434.4	8,880	6.1	8.4	1,466	1.31	11,598	M	
1881.									
Jan.... 1	434.3	7,990	5.6	7.3	1,430	1.45	11,619	M	
3	434.8	8,460	5 9	7.6	1,434	1.49	12.608	M	
4	434.9	8,630	6.1	7 6	1,420	1.55	13,356	M	
5	434.9	8,630	6.1	7.7	1,414	1.54	13,295	M	
6	434.9	8,660	6.1	7.6	1,414	1.56	13,526	M	
7	435.0	8,740	6.2	7.6	1,414	1 56	13,603	M	
8	434.7	8,570	6.0	7.5	1,418	1.48	12,716	M	
10	434.7	8,370	5.9	7.4	1,418	1.50	12,513	M	
11	434.6	8,240	5.8	7.4	1,412	1.41	11,604	M	
12	434.7	8,380	5.9	7.5	1,412	1.45	12,158	M	
13	434.7	8,330	5.9	7.5	1,412	1.47	12,222	M	
14	434.6	8,240	5 8	7.4	1,412	1 42	11,718	M	
15	434.5	8.080	5.7	7.2	1,412	1 39	11,212	M	
17	434.6	8,380	5.9	7.6	1,411	1.46	12,262	M	
18	434.6	8,250	5.9	7.6	1,408	1.51	12,468	M	
19	434.5	8,190	5.8	7.4	1,408	1.43	11,697	M	
20	434.5	7,940	5.6	7.4	1,408	1.44	11,426	M	
21	434.7	8,190	5.8	7 8	1,411	1.52	12 484	M	
22	434.7	8,420	5.9	7.8	1,419	1.49	12,515	M	
24	434.7	8,370	5.9	7.8	1,419	1.46	12,219	M	
25	434.6	8.320	5.9	7.8	1,419	1 44	12,025	M	
26	434.6	8,200	5.8	7.8	1,416	1.43	11,785	M	
27	434.4	8,020	5.7	7.6	1,417	1.36	10,879	M	
28	434.3	7,790	5.6	7.3	1,403	1 36	10,621	M	
29	434.5	8,130	5.8	7 5	1 409	1.43	11 624	M	
31	434.7	8,630	6.1	7.8	1,423	1.46	12,6.6	M	

Mississippi River.—Winona, Minn.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Feb.... 1	434.7	8,480	6.0	7.8	1,423	1.44	12,258	M	M = meter.
2	434.7	8,480	6.0	7.8	1,423	1.47	12,487	M	F = double floats.
3	434.7	8,450	5.9	7.7	1,423	1.42	11,986	M	R = rod floats.
4	434.7	8,370	5.9	7.7	1,423	1.44	12,064	M	
5	434.7	8,460	5.9	7.7	1,423	1.38	11,690	M	See page 12 for notes.
7	434.7	8,400	5.9	8.0	1,422	1.36	11,429	M	
8	434.8	8,500	6.0	8.0	1,423	1.41	11,958	M	
9	434.9	8,490	6.0	8.0	1,423	1.51	12,857	M	
10	434.9	8,530	6.0	8.0	1,423	1.51	12,897	M	
11	435.0	8,450	5.9	7.9	1,423	1.54	13,041	M	
12	435.0	8,420	5.9	8.1	1,423	1.48	12,460	M	
14	434.7	8,110	5.7	7.9	1,418	1.47	11,900	M	
15	434.6	7,950	5.6	7.9	1,414	1.46	11,639	M	
16	434.7	7,960	5.6	7.7	1,417	1.51	12,055	M	
17	434.6	8,000	5.7	7.7	1,414	1.44	11,553	M	
18	434.5	8,010	5.7	7.8	1,414	1.48	11,879	M	
19	434.6	8,100	5.7	7.6	1,414	1.51	12,254	M	
21	434.7	8,180	5.8	7.7	1,415	1.51	12,327	M	
22	434.7	8,210	5.8	7.6	1,415	1.50	12,318	M	
23	434.7	8,230	5.8	7.6	1,415	1.56	12,803	M	
24	434.5	7,900	5.6	7.4	1,406	1.47	11,616	M	
25	434.4	7,850	5.6	7.4	1,406	1.43	11,196	M	
26	434.6	8,015	5.7	7.4	1,408	1.50	11,992	M	
28	434.8	8,450	5.9	7.6	1,423	1.54	13,048	M	
Mar.... 1	434.7	8,420	5.9	7.5	1,422	1.55	12,999	M	
2	434.7	8,340	5.9	7.8	1,422	1.50	12,675	M	
3	434.8	8,520	6.0	7.8	1,422	1.53	12,957	M	
4	434.8	8,340	5.9	7.3	1,422	1.52	12,701	M	
5	434.7	8,380	5.9	7.3	1,421	1.47	12,297	M	
7	434.7	8,520	6.0	7.3	1,422	1.46	12,404	M	
8	434.8	8,600	6.1	7.3	1,421	1.51	13,010	M	
9	434.8	8,680	6.1	7.4	1,421	1.51	13,111	M	
10	434.8	8,780	6.2	7.4	1,421	1.44	12,574	M	
11	434.9	8,870	6.2	7.5	1,422	1.46	12,975	M	
12	434.9	8,880	6.2	7.5	1,422	1.50	13,300	M	
14	435.2	9,270	6.5	7.9	1,434	1.51	13,991	M	
15	435.3	9,540	6.6	7.9	1,437	1.55	14,783	M	
16	435.4	9,700	6.7	8.0	1,439	1.57	15,249	M	
17	435.7	9,890	6.9	8.3	1,441	1.60	15,798	M	
18	436.4	10,030	7.0	9.3	1,442	1.58	15,798	M	
19	436.5	10,110	7.0	9.4	1,443	1.64	16,616	M	
21	436.5	10,125	7.0	9.4	1,450	1.64	16,603	M	
22	436.7	10,350	7.1	9.5	1,453	1.62	16,778	M	
23	436.8	10,610	7.3	9.8	1,455	1.65	17,582	M	
24	437.3	10,810	7.4	10.3	1,455	1.67	18,104	M	
Apr.... 8	435.9	10,620	7.1	11.4	1,504	2.04	21,672	R	
9	435.8	10,540	7.0	11.7	1,504	2.13	22,434	R	
11	435.9	10,980	7.3	11.4	1,504	2.05	22,446	R	
12	436.0	11,370	7.4	11.7	1,544	2.14	24,311	R	
13	436.2	11,230	7.4	11.9	1,516	2.21	24,802	R	
14	436.5	11,470	7.5	11.9	1,521	2.22	25,518	R	
15	436.6	11,650	7.7	11.8	1,521	2.39	27,786	R	
16	436.8	11,780	7.7	11.8	1,525	2.33	27,417	R	
18	437.1	12,280	8.0	12.5	1,537	2.31	28,342	R	
19	437.3	12,490	8.1	12.6	1,540	2.40	29,920	R	
20	437.6	12,850	8.3	12.5	1,550	2.44	31,298	R	
21	438.0	13,510	7.9	13.4	1,700	2.63	35,568	R	
22	438.4	14,660	8.4	14.3	1,753	2.74	40,227	R	
23	438.9	14,780	8.5	13.9	1,731	2.83	41,797	R	
25	439.7	16,550	9.4	14.8	1,764	3.04	50,336	R	
26	440.0	16,890	9.6	15.5	1,766	3.11	52,544	R	
27	440.3	17,670	10.0	15.2	1,774	3.19	56,339	R	
28	440.9	18,920	10.6	16.3	1,783	3.28	62,156	R	
29	441.9	20,780	11.5	17.5	1,800	3.41	70,824	R	
May.. 13	442.8	23,570	13.1	20.0	1,803	3.14	73,924	R	

MISSISSIPPI RIVER.—WINONA, MINN.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
May....16	442.6	22,680	12.6	19.5	1,800	3.37	76,475	R	M = meter.
17	442.5	22,990	12.7	19.0	1,811	3.28	75,470	R	F = double floats.
18	442.5	22,920	12.7	19.0	1 812	3.28	75,157	R	R = rod floats.
19	442.6	22,710	12.5	18.8	1,812	3.34	75,797	R	
20	442.6	22,980	12.7	19.0	1,812	3.33	76,629	R	See page 12 for notes.
21	442.5	22,690	12.5	20.0	1,811	3.31	75,032	R	
23	442.3	21,880	12 1	19.7	1,803	3.24	70,981	R	
24	442.1	21,670	12.0	18 8	1,799	3 22	69,832	R	
25	441.9	21,330	11.9	19 0	1,797	3 25	69,387	R	
26	441.7	20,920	11.7	18.4	1,794	3.17	66,341	R	
27	441.5	20,290	11.3	18.1	1,791	3.10	62.876	R	
28	441.3	20,290	11.3	18.8	1,792	3 06	62,196	R	
30	440.8	19,370	10.8	18 0	1,787	3.00	58,162	R	
31	440 6	18,630	10.5	17.8	1,782	2.96	55 102	R	
June... 1	440.5	18,470	10.4	16.7	1,782	2.86	52,894	R	
2	440.6	18,355	10.3	16 5	1,780	2.89	53,084	R	
3	440.7	18,760	10.5	17.4	1,783	2.86	53.602	R	
4	441.0	19,310	10.8	17 0	1,787	3 05	58,929	R	
7	442 1	21 445	11 9	18.0	1,806	3.22	69,028	R	
8	442.1	21,115	11.7	19 0	1,807	3.24	68,485	R	
9	442.0	21,015	11.7	18.5	1,804	3.23	67,827	R	
10	442.0	20,920	11.6	18.6	1,802	3.16	66.012	R	
11	441.8	20.540	11.4	17.6	1,801	3.08	63,366	R	
13	441.4	20.105	11.2	18 2	1.796	3.05	61,311	R	
14	441.2	19,465	10.9	18.0	1,793	3.03	58,911	R	
15	440.9	19,135	10.7	19.0	1,790	2.94	56.244	R	
16	440.7	18,733	10 5	16.3	1,785	2.94	55,133	R	
17	440.5	18,245	10.2	15.7	1,782	2 90	52,886	R	
18	440.5	18,280	10.3	16.4	1,782	2.91	53,187	R	
20	440.6	18,895	10.6	17.7	1,785	2.96	55,891	R	
21	440.7	18,710	10 5	17.7	1.782	3.00	56,221	R	
22	440.7	18,540	10.4	16.5	1,782	2.97	55,110	R	
23	440.7	18.540	10.4	16.5	1.782	2.96	54,971	R	
24	440.8	18,625	10 5	16.8	1,782	2.92	54.402	R	
25	440.8	18,780	10.5	17.4	1,784	3.01	56,466	R	
27	440.7	18,530	10.4	16.8	1.784	2.88	53.469	R	
28	440.5	18,550	10.4	18.0	1,782	2.89	53,601	R	
29	440.3	18,430	10.4	17.8	1 778	2 85	52,524	R	
30	440.2	17,975	10.1	17 0	1,775	2.87	51,662	R	
July... 1	440.0	17,645	10.0	16.5	1,770	2.81	49,658	R	
2	440.0	17,405	9.9	16.7	1,767	2.72	47,443	R	
4	440.0	17,370	9.8	16 5	1,764	2.82	48,988	R	
5	439.7	16,945	9.6	15 8	1,761	2.78	47,039	R	
6	439.6	16.695	9.5	16.0	1.757	2.72	45,498	R	
7	439.4	16,560	9.4	16.1	1,756	2.72	45,021	R	
8	439.3	16,530	9.4	15.7	1.755	2.69	44,479	R	
9	439.1	16 380	9 4	16.0	1.749	2 67	43,792	R	
11	438.8	15,690	9.0	16.0	1.748	2.58	40,531	R	
12	438.6	15 345	8 8	15.3	1,748	2.58	39,612	R	
13	438.3	15,100	8.7	15.1	1,742	2.49	35,578	R	
14	438.0	14 525	8.4	14 7	1,737	2.42	35,210	R	
15	437 9	14,075	8.1	14.5	1,737	2 44	34,308	R	
16	437.9	13,985	8.1	14.5	1;782	2.44	34,109	R	
18	438.1	14,445	8.3	14.9	1,740	2.44	35,295	R	
19	438.2	14,535	8.4	15.0	1,740	2 48	36,063	R	
20	438.3	14,800	8.5	15.3	1,740	2 50	36,929	R	
21	438.5	15,350	8 8	15 8	1.747	2.56	39,248	R	
22	438.3	14,960	8 6	15 1	1.742	2.52	37,747	R	
23	438.2	14,525	8.3	15.0	1,742	2 48	36,056	R	
25	438.0	14,065	8.1	14 7	1,739	2 49	35,068	R	
26	437.8	13,625	8.0	13 4	1,696	2.42	32,921	R	
27	437.6	13,310	8 3	12.9	1,601	2.36	31,379	R	
28	437.4	12,855	8 2	13.0	1,576	2 35	30,241	R	
29	437.1	12,770	8.4	13.5	1,512	2 21	28,568	R	
30	437.0	12,450	8 5	13.3	1,459	2.17	27,011	R	

Mississippi River.—Winona, Minn.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Aug.... 1	436.7	12,160	8.4	13.3	1,441	2.09	25,372	R	M = meter.
2	436.6	11,950	8.4	13.2	1,423	2.06	24,650	R	F = double floats.
3	436.5	11,795	8.3	13.0	1,420	2.10	24,836	R	R = rod floats.
4	436.4	11,650	8.2	13.0	1,418	2.08	24,226	R	
5	436.4	11,685	8.3	13.0	1,413	2.06	24,092	R	See page 12 for notes.
6	436.4	11,630	8.2	13.0	1,416	2.08	24,207	R	
8	436.1	11,315	8.2	12.8	1,383	1.96	22,169	R	
9	436.4	11,605	8.2	13.0	1 410	2.08	24,185	R	
10	436.8	12,175	8.4	13.7	1,446	2 21	26,873	R	
11	437.0	12,505	8.5	13 7	1,467	2.26	28,331	R	
12	437.0	12,580	8.5	13.9	1,470	2.28	28,702	R	
13	437.1	12,758	8.6	14 0	1,490	2.29	29,260	R	
15	436.7	12.275	8.5	13 6	1,436	2.25	27,588	R	
16	436.5	11,650	8.2	13.1	1,419	2.18	25,390	R	
17	436.3	11,280	8.0	12.8	1,406	2.15	24,228	R	
18	436.4	11,380	8 1	12.9	1,412	2.20	25,063	R	
19	436.3	11,155	7.9	12.8	1,409	2.16	24,123	R	
20	436.3	10.920	7.8	12.7	1 405	2.16	23,624	R	
22	436.3	10,860	7.7	12 9	1 403	2 13	23,147	R	
23	436.5	10,085	7.2	12.9	1,408	2.24	24,883	R	
24	436 6	11,300	8 0	13 1	1,421	2.28	25.783	R	
25	436.8	11,630	8.1	13.4	1,432	2.29	26,606	R	
26	437 0	11,835	8.1	13.3	1,454	2.38	28,171	R	
27	437.3	12,280	8.0	13.5	1,529	2.50	30,653	R	
29	437.3	12,450	8.2	13.8	1,522	2.49	31,044	R	
30	437.9	13,350	8 0	13.8	1.668	2.62	34,934	R	
31	438.6	14 815	8 5	14.8	1,741	2.70	40,067	R	
Sept... 1	439.4	16,285	9 3	15.8	1,750	2.90	47,269	R	
2	439.9	17,315	9.9	16 7	1,760	3.03	52.443	R	
3	440.2	18,085	10.2	17.3	1,776	3.08	55,685	R	
5	440.0	17.810	10 1	17.4	1,768	3.03	53,912	R	
6	440.0	18,015	10.2	17.9	1,769	2.99	53,918	R	
7	439.9	17,915	10.1	18.0	1,767	2.92	53,327	R	
8	439.7	17,130	9.7	17.6	1,766	2.95	50,577	R	
9	439.6	16,685	9.5	17.1	1,765	2.85	47,598	R	
12	441.1	18,555	10.4	18.7	1,781	3.21	59,527	R	
13	442.0	20,145	11.2	19.1	1,798	3 31	66,630	R	
14	442.7	21.520	11.9	20 2	1,810	3.38	72,787	R	
15	443.4	23,320	12 8	20.8	1,816	3 52	82,159	R	
17	444.3	25,245	13.8	21.8	1,825	3.60	90,771	R	
19	444.2	25,060	13.8	21.5	1,823	3.57	89,390	R	
20	444.2	24.955	13 7	21.8	1,823	3 55	88,572	R	
21	444.2	24.945	13 7	22 0	1,820	3.55	88,643	R	
22	444.2	25,035	13 8	22.0	1,820	3.54	88,671	R	
23	441.1	24,740	13.6	21.9	1,819	3.54	87,568	R	
24	444.0	24.505	13 5	21 8	1,818	3.52	86,239	R	
26	443.7	23.915	13.2	21.1	1,818	3.45	82,577	R	
27	443.6	23.655	13.0	21.0	1,814	3 43	81,168	R	
28	443.8	23.785	13.1	20.2	1,814	3.43	81,675	R	
29	444.3	24,710	13.6	21.6	1,820	3.53	87,229	R	
30	444.8	25.995	14.3	22.0	1,822	3.60	93,622	R	
Oct.... 1	445.0	26,445	14.5	22.5	1,824	3.64	96,220	R	
3	445.4	27.335	15.0	22 4	1,825	3.79	103,711	R	
12	445.7	27,605	13.4	23.0	2,064	4.02	111,102	R	
13	445.8	27,695	13.4	23.1	2,066	4.11	113,883	R	
14	446.0	28.410	13.7	22.5	2,068	4.14	117,476	R	
15	446.5	29.555	14 2	23.0	2,075	4.31	127,441	R	
17	446.7	29 835	14.3	23.5	2,090	3.95	117,993	R	
18	446.5	29,510	14.1	22.9	2,088	4.07	120,049	R	
19	446.1	28,945	13.9	22.6	2,084	3.92	113,612	R	
20	445.8	28 350	14.2	21.9	1,993	3.77	106,988	R	
21	445.6	27,695	14.0	21.3	1,973	3.70	102,389	R	
22	445.1	27,380	14.9	21.7	1,838	3 66	100,291	R	

Mississippi River.—Winona, Minn.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
May....16	442.6	22,680	12.6	19.5	1,800	3.37	76,475	R	M = meter.
17	442.5	22,990	12 7	19.0	1,811	3.28	75,470	R	F = double floats.
18	442.5	22,920	12.7	19.0	1 812	3.28	75,157	R	R = rod floats.
19	442.6	22,710	12.5	18.8	1,812	3.34	75,797	R	
20	442.6	22,980	12.7	19.0	1,812	3.33	76,629	R	See page 12 for notes.
21	442.5	22,690	12.5	20.0	1,811	3.31	75,032	R	
23	442.3	21,880	12 1	19.7	1,803	3.24	70,981	R	
24	442.1	21,670	12.0	18 8	1,799	3 22	69,832	R	
25	441.9	21,330	11.9	19 0	1,797	3 25	69,387	R	
26	441.7	20,920	11.7	18.4	1,794	3.17	66,341	R	
27	441.5	20,290	11.3	18.1	1,791	3.10	62,876	R	
28	441.3	20,290	11.3	18.8	1,792	3 06	62,196	R	
30	440.8	19,370	10.8	18 0	1,787	3.00	58,162	R	
31	440.6	18,630	10.5	17 8	1,782	2.96	55 102	R	
June... 1	440.5	18,470	10.4	16.7	1,782	2.86	52,834	R	
2	440.6	18,355	10.3	16 5	1,780	2.89	53,084	R	
3	440.7	18,760	10.5	17.4	1,783	2.86	53.602	R	
4	441.0	19,310	10.8	17 0	1,787	3 05	58,929	R	
7	442 1	21 445	11 9	18.0	1,806	3.22	69,028	R	
8	442.1	21,115	11.7	19 0	1,807	3.24	68,485	R	
9	442.0	21,015	11.7	18.5	1,804	3.23	67.827	R	
10	442.0	20,920	11.6	18 6	1,802	3.16	66.012	R	
11	441.8	20.540	11.4	17.6	1,801	3.08	63,366	R	
13	441.4	20.105	11.2	18 2	1.796	3.05	61,311	R	
14	441.2	19,465	10.9	18.0	1,793	3.03	58,911	R	
15	440.9	19,135	10.7	19 0	1,790	2.94	56,244	R	
16	440.7	18,733	10 5	16.3	1,785	2.94	55,133	R	
17	440.5	18,245	10.2	15.7	1,782	2 90	52,886	R	
18	440.5	18,280	10.3	16.4	1,782	2.91	53,187	R	
20	440.6	18,895	10.6	17.7	1,785	2.96	55,891	R	
21	440.7	18,710	10 5	17.7	1.782	3.00	56,221	R	
22	440.7	18,540	10.4	16.5	1,782	2.97	55,110	R	
23	440.7	18.540	10.4	16 5	1.782	2.96	54,971	R	
24	440.8	18,625	10 5	16.8	1,782	2.92	54,402	R	
25	440.8	18,780	10.5	17.4	1,784	3.01	56,466	R	
27	440.7	18,530	10.4	16.8	1.784	2 88	53,469	R	
28	440.5	18,550	10.4	18.0	1,782	2.89	53,601	R	
29	440.3	18,430	10.4	17.8	1 778	2 85	52,524	R	
30	440.2	17,975	10.1	17 0	1,775	2.87	51,662	R	
July... 1	440.0	17,645	10.0	16.5	1,770	2.81	49,658	R	
2	440.0	17,405	9.9	16.7	1,767	2.72	47,443	R	
4	440.0	17,370	9.8	16 5	1,764	2.82	48,988	R	
5	439.7	16,945	9.6	15 8	1,761	2.78	47,039	R	
6	439.6	16.695	9.5	16.0	1.757	2.72	45,498	R	
7	439.4	16,560	9.4	16.1	1,756	2.72	45,021	R	
8	439.3	16,530	9.4	15.7	1.755	2.69	44,479	R	
9	439.1	16 380	9 4	16 0	1,749	2 67	43,792	R	
11	438.8	15,690	9.0	16.0	1.748	2.58	40,531	R	
12	438.6	15 345	8 8	15.3	1,748	2.58	39,612	R	
13	438.3	15.100	8.7	15.1	1,742	2.49	35,578	R	
14	438.0	14 525	8.4	14 7	1,737	2.42	35,210	R	
15	437.9	14,075	8.1	14.5	1,737	2 44	34,308	R	
16	437.9	13,985	8.1	14.5	1,732	2.44	34,109	R	
18	438.1	14,445	8.3	14.9	1,740	2.44	35,295	R	
19	438.2	14,535	8.4	15.0	1,740	2 48	36,063	R	
20	438.3	14,800	8.5	15.3	1,740	2 50	36,929	R	
21	438.5	15,350	8 8	15 8	1,747	2.56	39,248	R	
22	438.3	14,960	8 6	15 1	1,742	2.52	37,747	R	
23	438.2	14,525	8.3	15.0	1,742	2.48	36,056	R	
25	438.0	14,065	8.1	14 7	1,739	2 49	35,068	R	
26	437.8	13,625	8 0	13 4	1,696	2.42	32,921	R	
27	437.6	13,310	8 3	12.9	1,691	2.36	31,379	R	
28	437.4	12,855	8 2	13.0	1,576	2 35	30,241	R	
29	437.1	12,770	8.4	13.5	1,512	2 24	28,566	R	
30	437.0	12,450	8 5	13.3	1,459	2.17	27,011	R	

Mississippi River.—Winona, Minn.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Aug.... 1	436.7	12,160	8.4	13.3	1,441	2.09	25,372	R	M = meter.
2	436.6	11,950	8.4	13 2	1,423	2.06	24,650	R	F = double floats.
3	436.5	11,795	8.3	13.0	1,420	2.10	24,836	R	R = rod floats.
4	436.4	11,650	8.2	13.0	1,418	2.08	24,226	R	
5	436.4	11,685	8.3	13.0	1,413	2.06	24,092	R	See page 12 for notes.
6	436.4	11,630	8.2	13.0	1,416	2.08	24.207	R	
8	436.1	11,315	8.2	12.8	1,383	1.96	22,169	R	
9	436.4	11,605	8.2	13.0	1 410	2.08	24,185	R	
10	436.8	12,175	8.4	13.7	1,446	2 21	26,873	R	
11	437.0	12,505	8.5	13 7	1,467	2.26	28,331	R	
12	437.0	12,560	8.5	13.9	1,470	2 28	28,702	R	
13	437.1	12.758	8.6	14 0	1.490	2.29	29,260	R	
15	436.7	12,275	8.5	13 6	1,456	2.25	27,583	R	
16	436.5	11,650	8.2	13.1	1,419	2.18	25,390	R	
17	436.3	11,280	8.0	12.8	1,406	2.15	24,226	R	
18	436.4	11.380	8 1	12.9	1,412	2.20	25,063	R	
19	436.3	11,155	7.9	12.8	1,409	2.16	24,123	R	
20	436.3	10.920	7.8	12.7	1 405	2.16	23,624	R	
22	436.3	10,860	7.7	12 9	1 403	2 13	23,147	R	
23	436.5	10,085	7.2	12.9	1,408	2.24	24,883	R	
24	436 6	11,300	8 0	13 1	1,421	2.28	25.783	R	
25	436.8	11,630	8.1	13.4	1,432	2 29	26,606	R	
26	437 0	11,835	8.1	13.3	1,454	2.38	28,171	R	
27	437.3	12,280	8.0	13.5	1,529	2.50	30,653	R	
29	437.3	12,450	8.2	13.8	1,522	2.49	31,044	R	
30	437.9	13,350	8 0	13.8	1.668	2.62	34,934	R	
31	438.6	14 815	8 5	14.8	1,741	2.70	40,067	R	
Sept... 1	439.4	16,285	9 3	15.8	1,750	2.90	47,269	R	
2	439.9	17,315	9.9	16 7	1,760	3.03	52.443	R	
3	440.2	18,085	10.2	17.3	1,776	3.08	55,685	R	
5	440.0	17.810	10.1	17 4	1,768	3.03	53,912	R	
6	440.0	18,015	10.2	17.9	1,769	2.99	53,918	R	
7	439.9	17.915	10.1	18.0	1,767	2.92	53,327	R	
8	439.7	17,130	9.7	17.6	1,766	2.95	50,577	R	
9	439.6	16,685	9.5	17.1	1,765	2.85	47,538	R	
12	441.1	18,555	10.4	18.7	1,781	3.21	59,527	R	
13	442.0	20,145	11.2	19.1	1,798	3 31	66,630	R	
14	442.7	21.520	11.9	20 2	1,810	3.38	72,737	R	
15	443.4	23,320	12 8	20.8	1,816	3 52	82,159	R	
17	444.3	25,245	13.8	21.8	1,825	3.60	90,771	R	
19	444.2	25,060	13.8	21.5	1,823	3.57	89,390	R	
20	444.2	24.955	13 7	21.8	1,823	3 55	88,572	R	
21	444.2	24.945	13 7	22 0	1,820	3.55	88,643	R	
22	444.2	25,035	13.8	22.0	1,820	3.54	88,671	R	
23	444.1	24,740	13.6	21.9	1,819	3.54	87,568	R	
24	444.0	24.505	13 5	21 8	1,818	3.52	86,239	R	
26	443.7	23.915	13.2	21.1	1,818	3.45	82,577	R	
27	443.6	23.655	13.0	21 0	1,814	3.43	81,168	R	
28	443.5	23.785	13.1	20.2	1,814	3.43	81,675	R	
29	444.3	24,710	13.6	21 6	1,820	3.53	87,229	R	
30	444.3	25,995	14.3	22.0	1,822	3.60	93,622	R	
Oct.... 1	445.0	26,445	14 5	22.5	1,824	3.64	96,220	R	
3	445.4	27,335	15.0	22.4	1,825	3.79	103,711	R	
12	445.7	27,605	13.4	23.0	2,064	4.02	111,102	R	
13	445.8	27,695	13.4	23.1	2,066	4.11	113,883	R	
14	446.0	28.410	13.7	22.5	2,068	4.14	117,476	R	
15	446.5	29.555	14 2	23.0	2,075	4.31	127,441	R	
17	446.7	29 835	14.3	23.5	2,090	3.95	117,993	R	
18	446.5	29,510	14.1	22.9	2,088	4.07	120,049	R	
19	446.1	28,945	13.9	22.6	2,084	3.92	113,612	R	
20	445.8	28 350	14.2	21.9	1,993	3.77	106,988	R	
21	445.6	27,695	14.0	21.3	1,973	3.70	102,389	R	
22	445.1	27,380	14.9	21.7	1,838	3.66	100,291	R	

Mississippi River.—Clayton, Iowa.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1880.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Dec.... 7	2.9	18,735	12.9	26.0	1,455	1.26	23,679	M	M = meter.
9	2.7	18,623	12.8	26.0	1,455	1 19	22,225	M	F = double floats.
10	2.4	19,024	13.1	26.0	1,455	1.12	21,217	M	R = rod floats.
14	2.1	18,841	13.0	25.2	1,455	1.16	21,910	M	
15	2.2	18,826	12.9	25.4	1,455	1.21	22,694	M	Discharge section is about 4,000 feet below principal street of Clayton, Iowa, and about 7 miles below mouth of the Wisconsin River. On and after April 12, 1881, the mean area of two sections 100 ft. apart was used in computing discharge, hence no maximum soundings are given during this time. Zero of gauge 623.4 ft. above Cairo datum plane. (Tabulation, Report C. of E. 1883, p. 2243. Field report, C. of E. 1884, p. 2584.)
16	2.2	18,977	13.0	25.5	1,455	1.24	23,460	M	
17	2.3	19,036	13.1	25.5	1,455	1.26	24,081	M	
18	2.3	19,158	13.2	25.5	1,455	1.26	24,210	M	
20	2.2	19,061	13.1	25.4	1,455	1.26	23,983	M	
21	2.1	18,977	13.0	25.3	1,455	1.24	23,550	M	
22	2.0	18,769	12.9	25.2	1,455	1.24	23,192	M	
23	1.9	18,695	12.8	25.2	1,455	1.23	23,020	M	
24	1.8	18,589	12.7	25 2	1,455	1.21	22,443	M	
27	1.6	18,447	12.7	25.0	1,453	1.17	21,502	M	
30	1.4	18,270	12.6	24.7	1,453	1.10	20,120	M	
31	1.0	17,838	12.3	24.5	1,448	1.03	18,306	M	
1881.									
Jan.... 1	0.4	17,347	12.0	24.0	1,448	0.95	16,397	M	
4	0.4	17,422	12.0	24.0	1,448	1.00	17,343	M	
5	0.6	17,642	12 2	24.2	1,448	1.03	18,179	M	
6	0.8	17,920	12.4	24 8	1,450	1.08	19,325	M	
7	0.9	17,999	12.4	24.5	1,450	1.09	19,566	M	
8	1.0	18,130	12.5	24 6	1,450	1.09	19,700	M	
10	1.1	18,209	12.6	24.6	1,450	1.09	19,785	M	
11	1.1	18,249	12.6	24 6	1,450	1.09	19,913	M	
12	1.0	18,218	12.6	24.5	1,450	1.09	19,800	M	
13	1.0	18,218	12.6	24.5	1,450	1.08	19,611	M	
14	1.0	18,209	12.6	24.6	1,450	1.06	19,351	M	
15	1.0	18,209	12.6	24.6	1,450	1.06	19,252	M	
17	0.8	17,954	12.4	24.3	1,450	1.05	18,787	M	
18	0.8	17,893	12.3	24.4	1,450	1.02	18,219	M	
19	0.7	17,893	12.3	24.4	1,450	1.02	18,182	M	
20	0.7	17,893	12.3	24.4	1,450	1.02	18,242	M	
21	0.7	17,893	12.3	24.4	1,450	1.03	18,432	M	
22	0.6	17,758	12.2	24.3	1,450	1.02	18,118	M	
26	0.7	17,721	12.3	24 3	1,444	1.05	18,633	M	
27	0.7	17,718	12.3	24.3	1,442	1.04	18,358	M	
28	0.7	17,605	12.2	24.2	1,439	1.02	18,045	M	
29	0.6	17,487	12.2	24.2	1,439	1.03	18,078	M	
31	0.5	17,312	12.0	24 1	1,439	1.01	17,516	M	
Feb.... 1	0.5	17,259	12.0	24.0	1,438	1.01	17,396	M	
2	0.5	17,294	12.0	24.0	1,438	1.01	17,477	M	
3	0.5	17,408	12.1	24 0	1,438	1.01	17,574	M	
4	0.5	17,372	12.1	24.0	1,438	1.02	17,772	M	
5	0.5	17,359	12.1	24.0	1,438	1.01	17,582	M	
7	0.5	17,211	12.0	23.8	1,438	1.01	17,317	M	
9	0.5	17,347	12.1	24.1	1,438	1.01	17,566	M	
10	0.5	17,268	12.0	24.0	1,438	1.04	17,909	M	
11	0.5	17,396	12.1	24.0	1,438	1.04	18,161	M	
14	0.7	17,312	12.0	23.9	1,438	1.06	18,262	M	
15	0.7	17,356	12.1	24.1	1,438	1 04	17,978	M	
16	0.6	17,325	12 0	24.0	1,438	1.04	17,990	M	
17	0.6	17,347	12.1	24.1	1,438	1.03	17,872	M	
18	0.5	17,272	12.0	23.9	1,438	1.03	17,792	M	
19	0.5	17,303	12.0	23.9	1,438	1 02	17,707	M	
21	0.5	17,282	12.0	23.9	1,438	1.04	17,955	M	
22	0.6	17,396	12.1	24.0	1,438	1.05	18,209	M	
23	0.6	17,369	12 1	23 9	1,438	1.06	18,358	M	
24	0.6	17,505	12.2	24.1	1,438	1.08	18,869	M	
25	0.6	17,492	12.2	24.0	1,438	1.08	18,826	M	
26	0.6	17,509	12.2	24.0	1,438	1.07	18,813	M	
28	0.6	17,405	12.1	24.0	1,438	1.06	18,403	M	
Mar.... 1	0.6	17,474	12.2	24.0	1,438	1 07	18,680	M	
4	0.9	17,809	12.4	24.2	1,438	1.11	19,808	M	
5	0 9	17,822	12.4	24.2	1,438	1.12	19,937	M	
7	0 9	17,751	12.3	24.1	1,438	1.12	19,929	M	
8	0.8	17,737	12 3	24.2	1,438	1.12	19,891	M	

Mississippi River.—Clayton, Iowa.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Mar.... 9	0.8	17,746	12.3	24.2	1,438	1.10	19,542	M	M = meter.
10	0.8	17,812	12.4	24.2	1,438	1.12	19,889	M	F = double floats.
11	0.9	17,873	12.4	24 3	1,438	1.12	19,953	M	R = rod floats.
12	1.0	18,022	12.5	24.5	1,438	1.13	20,401	M	
14	1.3	18,380	12.8	24.7	1,438	1.17	21,529	M	See page 16 for notes.
15	1.4	18,630	13.0	24.8	1,438	1.20	22,321	M	
16	1.6	18,783	13.1	24.9	1,438	1.20	22,625	M	
17	1.6	18,888	13.1	25.0	1,438	1.25	23,573	M	
18	1.7	18,923	13.2	25.1	1,438	1.28	24,214	M	
19	1.8	19,059	13.3	25.2	1,438	1.30	24,694	M	
21	2.2	19,506	13.6	25.5	1,438	1.37	26,683	M	
22	2.4	19,807	13.8	25.6	1,438	1.43	28,125	M	
23	2.7	20,132	14.0	25.9	1,438	1.48	29,739	M	
24	3.0	20,670	14.2	26.3	1,452	1.51	31,268	M	
25	3.6	21,351	14.7	27.0	1,452	1.60	34,218	M	
26	4.1	22,218	15.3	27.3	1,455	1.66	36,884	M	
28	5.0	23,641	16.2	28.5	1,459	1.80	42,603	M	
Apr....12	4.8	23,171	15.9	.....	1,459	2.16	50,051	R	
13	4.6	22,939	15.7	.....	1,459	2.09	47,918	R	
15	4.6	22,878	15.7	.....	1,459	2.15	49,207	R	
18	5.2	23,966	16.4	.....	1,460	2.24	53,958	R	
21	5.8	24,571	16.9	.....	1,462	2.38	58,803	R	
22	6.0	24,898	17.0	.....	1,463	2.44	60,765	R	
23	6.2	25,237	17.2	.....	1,464	2 52	63,710	R	
25	6.6	25,556	17.4	.....	1,465	2.61	66,628	R	
26	6.7	25,755	17.6	.....	1,466	2.61	67,230	R	
28	7.1	26,308	17.9	.....	1,469	2.76	72,585	R	
29	7.3	26,577	18.1	.....	1,470	2.77	73,643	R	
May... 2	8.3	27,667	18.8	.....	1,470	2.72	75,393	R	
3	9.1	29,471	20.0	.....	1,471	3.33	98,080	R	
5	12.2	33,836	23.0	.....	1,483	4.01	135,580	R	
7	13.7	35,895	24.2	.....	1,483	4.00	143,626	R	
10	13.5	35,279	23.8	.....	1,483	3.89	137,342	R	
11	13.1	35,350	23.8	.....	1,483	3.81	134,826	R	
16	11.1	32,322	21.9	.....	1,478	3.53	114,065	R	
17	10.9	31,759	21.5	.....	1,478	3.53	111,983	R	
18	10.7	31,496	21.3	.....	1,478	3.45	108,628	R	
19	10.5	31,372	21.2	.....	1,478	3.41	107,104	R	
20	10.4	31,416	21.3	.....	1,478	3.42	107,442	R	
21	10.3	31,046	21.0	.....	1,477	3.38	104,875	R	
23	10.1	30,483	20.6	.....	1,477	3.21	97,790	R	
24	10.0	30,474	20.6	.....	1,476	3.20	97,609	R	
25	9.8	30,087	20.4	.....	1,476	3.20	96,299	R	
26	9.6	29,833	20.2	.....	1,475	3.16	94,334	R	
27	9.4	29,585	20.1	.....	1,475	3.10	91,715	R	
28	9.2	29,664	20.1	.....	1,474	3.07	91,130	R	
30	8.8	28,670	19.5	.....	1,473	2.95	84,658	R	
31	8.6	28,151	19.1	.....	1,472	3.01	84,735	R	
June... 1	8.4	27,816	18.9	.....	1,471	2.60	72,268	R	
2	8.1	27,667	18.8	.....	1,470	2.79	77,195	R	
4	7.7	26,980	18.3	.....	1,472	2.71	73,199	R	
6	7.8	27,068	18.4	.....	1,469	2.89	78,120	R	
7	8.1	27,517	18.7	.....	1,471	2.84	78,095	R	
8	8.4	27,702	18.8	.....	1,472	2.92	80,918	R	
9	8.7	28,388	19.3	.....	1,474	2.99	84,939	R	
10	9.0	28,934	19.6	.....	1,475	3.07	88,944	R	
13	9.3	29,356	19.9	.....	1,475	3.14	92,092	R	
14	9.2	29,700	20.2	.....	1,474	3.04	90,406	R	
15	9.1	29,761	20.2	.....	1,474	3.08	91,725	R	
16	8.8	29,224	19.8	.....	1,473	2.93	85,600	R	
17	8 6	28,864	19.6	.....	1,472	2.88	83,186	R	
18	8.3	28,635	19.5	.....	1,471	2.83	81,094	R	
20	8.1	28,740	19.6	.....	1,470	2.77	79,497	R	
21	8.0	28,776	19 6	.....	1,470	2.76	79,279	R	
22	7.9	28,476	19.4	.....	1,469	2.71	77,172	R	

MISSISSIPPI RIVER.—CLAYTON, IOWA.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1861.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
June...23	7.9	28,740	19.6	.....	1,469	2 71	77,858	R	M = meter.
24	8.0	28,714	19.5	.....	1,469	2.72	78,074	R	F = double floats.
25	8.0	28,740	19.6	.....	1,469	2.75	79,094	R	R = rod floats.
27	7.9	28,837	19.6	.....	1,469	2.74	78,986	R	
28	7.8	28,679	19.5	.....	1,469	2.72	78,007	R	See page 16 for notes.
29	7.7	28,482	19.4	.....	1,468	2.71	76,989	R	
30	7.6	28,415	19.4	.....	1,468	2.65	75,328	R	
July... 1	7.4	28,512	19.4	.....	1,468	2 58	73,675	R	
2	7.2	27,957	19 0	.....	1,468	2.56	71,571	R	
5	6.7	26,910	18.4	.....	1,466	2.48	66,764	R	
6	6.6	26,532	18.1	.....	1,465	2.39	63,438	R	
7	6.7	26,646	18.2	.....	1,466	2.45	65,208	R	
8	6.6	26,752	18.3	.....	1,466	2.42	64,793	R	
9	6.6	26,787	18.3	.....	1,465	2.42	64,840	R	
11	6.8	27,060	18.4	.....	1,468	2.46	66,513	R	
12	6.8	27,209	18.5	.....	1,468	2.47	67,126	R	
13	6.6	27,007	18.4	.....	1,467	2.40	64,709	R	
14	6.2	26,417	18 0	.....	1,465	2.31	61,077	R	
15	5.9	25,819	17.6	.....	1,463	2.22	57,318	R	
16	5.5	25,203	17.2	.....	1,463	2.18	55,018	R	
18	4.8	24,261	16.6	.....	1,462	2.02	49,105	R	
19	4.6	24,041	16.4	.....	1,462	2.00	47,987	R	
22	5.1	24,455	16.7	.....	1,463	2.17	53,043	R	
23	5.5	25,194	17.2	.....	1,464	2.30	57,896	R	
25	6.2	26,426	18.0	.....	1,465	2.39	63,212	R	
26	6.2	26,294	17.9	.....	1,465	2.37	62,282	R	
28	5.5	25,432	17.4	.....	1,464	2.20	55,950	R	
29	5.1	24,798	16.9	.....	1,463	2.10	52,175	R	
30	4.7	24,006	16.4	.....	1,462	2.00	48,036	R	
Aug... 1	4.0	22,976	15.7	.....	1,460	1.80	41,289	R	
2	3.7	22,422	15.4	.....	1,454	1.73	38,863	R	
4	3.1	21,762	15.0	.....	1,447	1.65	35,907	R	
5	2.9	21,364	14.8	.....	1,447	1.61	34,354	R	
6	2.8	21,111	14.6	.....	1,446	1.61	33,967	R	
8	2.6	20,715	14.3	.....	1,446	1.51	31,217	R	
9	2.6	20,548	14.2	.....	1,445	1 56	32,054	R	
11	2 6	20,688	14.3	.....	1,446	1.52	31,488	R	
12	2.8	20,700	14.3	.....	1,447	1.63	33,720	R	
13	3.0	20,812	14.4	.....	1,450	1.72	35,774	R	
15	3.3	21,322	14.7	.....	1,453	1.71	36,482	R	
16	3.3	21,454	14.8	.....	1,453	1.70	36,408	R	
18	3.1	21,023	14.5	.....	1,452	1.68	35,403	R	
19	3.0	20,741	14.3	.....	1,452	1.67	34,638	R	
20	2.8	20,556	14.2	.....	1,449	1.65	33,877	R	
22	2.6	20,204	14 0	.....	1,448	1.59	32,125	R	
23	2.4	19,976	13.8	.....	1,444	1.60	31,921	R	
26	2.6	20,248	14.0	.....	1,446	1.64	33,106	R	
27	2.9	20,671	14.3	.....	1,449	1.68	34,810	R	
29	3.2	21,111	14.5	.....	1,453	1.71	36,163	R	
31	3.4	21,428	14.7	.....	1,457	1.80	38,665	R	
Sept... 1	3.6	21,621	14.8	.....	1,458	1.78	38,594	R	
2	4.2	22,704	15.5	.....	1,466	1.99	45,135	R	
3	4.9	23,997	16.4	.....	1,463	2.19	52,530	R	
5	5.9	25,115	17.2	.....	1,464	2.38	59,673	R	
6	6.1	25,572	17.5	.....	1,465	2.41	61,579	R	
7	6.2	26,012	17.8	.....	1,465	2.63	68,491	R	
8	6.3	26,241	17.9	.....	1,465	2.50	65,053	R	
9	6.4	23,269	17.9	.....	1,466	2.45	64,333	R	
13	6.9	26,998	18.4	.....	1,468	2.64	71,275	R	
14	7.2	27,244	18.5	.....	1,469	2.70	73,452	R	
15	7.6	28,010	19.0	.....	1,471	2 84	79,606	R	
18	9.8	31,944	21.6	.....	1,478	3.44	109,855	R	
20	11.2	34,003	22.9	.....	1,482	3.66	124,621	R	
21	11.6	34,293	23.1	.....	1,487	3 73	127,949	R	
22	12.0	35,296	23.7	.....	1,488	3.78	133,351	R	

Mississippi River.—Clayton and Burlington, Iowa.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Sept.. 23	12.2	35,789	24.1	.....	1,488	3.74	133,781	R	M = meter.
24	12.2	35,516	23.9	.....	1,488	3.78	134,360	R	F = double floats.
26	12.2	35,402	23.8	.....	1,488	3.66	129,502	R	R = rod floats.
27	12.1	35,552	23.9	.....	1,488	3.65	129,693	R	
28	12.0	35,226	23.7	.....	1,488	3.64	128,227	R	See page 16 for notes.
29	11.9	35,094	23.6	.....	1,488	3.64	127,838	R	
30	12.3	35,656	24.0	.....	1,488	3.77	134,462	R	
Oct.... 1	12.4	35,807	24.1	.....	1,488	3.68	131,699	R	
3	13.0	36,608	24.6	.....	1,488	3.96	144,968	R	
4	13.7	37,620	25.3	.....	1,488	4.04	152,050	R	
7	15.3	40,180	27.0	.....	1,488	4.10	164,540	R	
8	16.2	41,272	27.7	.....	1,488	4.21	173,796	R	
10	17.6	44,062	29.6	.....	1,488	4.07	179,118	R	
12	17.2	43,832	29.5	.....	1,488	4.03	176,777	R	
13	16.9	43,111	29.0	.....	1,488	4.05	174,600	R	
16	16.4	42,819	28.4	.....	1,488	3.99	168,811	R	
18	17.4	43,516	29.2	.....	1,488	3 98	173,150	R	
19	17.6	43,973	29.6	.....	1,488	3.96	174,355	R	
21	18.0	44,123	29.7	.....	1,488	4.04	178,083	R	
22	17.9	44,158	29.7	.....	1,488	4.04	178,355	R	
24	17.6	43,815	29.4	.....	1,488	3.92	171,974	R	

Mississippi River.—Burlington, Iowa.

1866.									Observations of 1866 by Gen. Warren. (Report of C. of E. 1867, p. 320.)
Oct....23	‡ 1.0	....	.....	.....	.....	.....	36,100	F	
1879.									
Ap. 18-19*	3.3	.....	.....	.....	.....	.....	51,600	F	
28*	2.1	.....	.....	.....	.....	.....	41,400	F	‡Gauge reading is assumed 1' above low water.
May.. 2*	1.8	.....	.....	.....	.....	.....	37,900	F	
9*	1.7	.....	.....	.....	.....	.....	38,400	F	
28†	5.2	.....	.....	.....	.....	.....	74,800	F	F = double floats.
29*	4.4	.....	.....	.....	.....	.....	66,950	F	* Section No. 1.
June.. 2*	7.1	.....	.....	.....	.....	.....	97,950	F	† Section No. 2.
3†	7.2	34,791	14.5	.....	2,406	2.98	103,536	F	
12†	6.2	.....	.....	.....	.....	.....	83,100	F	
18*	5.1	.....	.....	.....	.....	.....	70,400	F	
23†	4.0	.....	.....	.....	.....	.....	53,900	F	
Sept .17†	1.5	.....	.....	.....	.....	.....	34,600	F	
Oct . 4†	0.7	19,749	8.5	.....	2,333	1.41	27,929	F	
9-10*	0.8	.....	.....	.....	.....	.....	28,700	F	

Note.—Discharges of 1879 were measured at two places in front of the city of Burlington and designated sections Nos. 1 and 2. Sections about 4,500 feet apart. Section No. 1 is opposite the Burlington, Cedar Rapids and Northern freight depot, and No. 2 is opposite foot of Locust st. Section No. 2 is regarded by Maj. Mackenzie as the better adapted for observations on account of its greater stability.

The quantities tabulated for June 3 and October 4 are from table on page 1519, Rept. C. of E. 1880. The discharges and gauge readings for other days are scaled from Plate 4, published next to table above referred to.

The gauge readings are referred to low water, at Burlington, as zero, which is 581.6 ft. above the Cairo datum plane.

Observations made under direction of Major F. W. Farquhar, and as requested by the Board of Engineers on Low Water Navigation of Mississippi River.

Mississippi River.—Hannibal, Mo.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1880.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Nov....12	74.0	20,311	16.4	31.7	1,241	2.16	43,885	R	M = meter.
13	74.1	20,363	16 4	31.5	1,241	2.09	42,600	R	F = double floats.
15	74.6	21,221	16.6	33.5	1,277	2.28	48,373	R	R = rod floats.
Dec.13,14	73.1	18,805	15.0	31.0	1,250	1.89	35,586	R&M	
1881.									(Tabulation, Report C. of E, 1883, p. 2248. Field report, 1884, p. 2661).
Jan..3, 4	73.4	18,841	15.2	30.7	1,240	1.57	29,599	M	
11,12	72.4	17,693	14.3	29.7	1,240	1.41	24,937	M	
18	72.7	17,802	14.4	29.7	1,240	1.42	29,189	M	
19	72.7	17,959	14.5	30.2	1,240	1.40	25,252	M	
20	72.6	18,065	14.6	30.2	1,240	1.40	25,371	M	The discharge section was located about 500′ upstream from, and parallel to, the Hannibal bridge.
25,26	72.4	17,647	14.2	29.7	1,240	1.32	23,286	M	
28	72.4	17,546	14.2	29.7	1,240	1.28	22,496	M	
29	72.4	17,581	14.2	29.7	1,240	1.28	22,548	M	
31	72.3	17,493	14.1	29.7	1,240	1.30	22,655	M	
Feb.... 3	72.4	17,523	14.1	29.7	1,240	1.30	22,793	M	After February 9 the river widths change abruptly, owing to submergence of wide shelves on left bank; hence the mean depths are omitted after March 1st. Gauge readings herein tabulated are referred to a zero 399.72 feet above the Cairo datum plane, and 70 ft. below the zero of the Hannibal bridge gauge.
4	72.4	17,595	14.2	29.7	1,240	1.32	23,300	M	
5	72.4	17,458	14.1	29.5	1,240	1.32	23,085	M	
7	73.2	18,658	14.7	31.0	1,260	1.62	30,163	M	
9	75.4	21,647	16.1	33.0	1,342	2.03	43,916	M	
10	76.2	22,744	.....	34.0	1,543	2.44	55,391	M	
17	74.8	20,822	16.1	33.0	1,291	2.02	41,937	M	
19	74.4	20,156	15.6	32.0	1,291	1.86	37,557	M	
21	74.0	19,642	15.4	31.5	1,272	1.75	34,399	M	
23	73 7	19,146	15.1	31 0	1,267	1.60	30,540	M	
24	73.6	19,220	15.2	31.0	1,267	1.58	30,332	M	
25	73.5	19,176	15.1	31.0	1,267	1.56	29,917	M	
26	73.4	19,079	15.1	31.0	1,263	1.55	29,594	M	
Mar.... 1	76.2	23,117	.....	34.0	1,543	2.40	55,406	M	Sny Levee broke 2 a. m. Apr. 25, 1881; 1¼ miles above discharge section, crevasse 120′ wide.
2	76.6	23,570	.....	34 5	1,543	2.56	60,472	M	
5	77.7	25,083	.....	35.8	1,544	2.91	72,945	M	
8	77.4	24,391	.....	35.5	1,544	2.76	67,324	M	
9	77.1	23,839	.....	35.0	1,544	2.63	62,656	M	
10	76.7	23,287	.....	35 0	1,544	2.60	60,621	M	
Apr....29	88.2	52,498	.....	50.8	2,535	5.19	272,609	R	
May...2,3	86.6	47,568	.....	47.3	2,535	4.98	234,662	R	
4,5	85.8	44,913	.....	46.0	2,520	4.78	214,469	R	
9,10	83.2	38,003	.....	43.8	2,505	4.26	162,061	R	
11	83.0	37,333	.....	43.5	2,505	4.42	164,942	R	
13	83.6	38,420	.....	44.0	2,505	4.53	174,098	R	
16,17	85.2	43,830	.....	46.0	2,525	4.78	209,281	R	
18,19	86.0	46 091	.....	47.2	2,525	4.87	224,659	R	
23,24	84.9	41,766	.....	43.9	2,520	4.45	185,707	R	
25,26	83.9	39,408	.....	43.4	2,505	4 36	171,788	R	
30	81.3	34,295	.....	41.5	1,588	3.99	136,842	R	
June... 1	81.3	33,261	.....	39.8	1,580	3.72	123,740	R	
3,4	80.7	31,935	.....	38.8	1,574	3.69	118,052	R	
6	80.2	31,221	.....	38.8	1,575	3.52	109,899	R	
7	80.1	31,356	.....	40.5	1,575	3.62	113,606	R	
13	81.8	34,054	.....	42.5	1,585	4.06	138,334	R	
14	82.2	34,866	.....	42.8	1,585	4.22	147,060	R	
18	83.3	38,931	.....	43.3	2,505	4.53	176,410	R	
22,23	84.4	41,495	.....	46.0	2,515	4.69	194,425	R	
24	84.4	38,919	.....	.....	.....	.....	.....	R	
	84.2	.....	.....	44.1	2,505	4 47	173 822	R	
25	83.6	.....	.....	.....	.....	.....	.....	R	
28	82.2	33,120	.....	42.0	1,585	4.19	138,701	R	
29	82.8	34,963	.....	41.8	2,505	4.35	151,961	R	
July... 6	81.4	31,494	.....	39.0	1,580	3.95	124,375	R	
8	80.0	29,449	.....	38.5	1,576	3.51	103,439	R	
11	79.1	27,684	.....	36.9	1,570	3.25	89,971	R	
15	82.8	35,183	....	41.2	1,675	4.35	152,987	R	
18,19	85.6	41,920	....	44.5	2,520	5.12	214,679	R	
20,21	86.7	45,320	.....	45.0	2,525	5.17	234,286	R	
26	80.8	30,661	.....	39.5	1,580	3.79	116,272	R	
27	80.1	29,268	.....	39.2	1,576	3.60	105,262	R	
29	79.6	28,465	... ...	37.4	1,573	3.50	99,621	R	

MISSISSIPPI RIVER.—HANNIBAL, MO.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Aug.... 2	78.6	27,048	.....	38.0	1,565	3.32	89,874	R	M = meter.
3	78.4	26,524	.....	36.9	1,562	3.21	85,180	R	F = double floats.
5	77.5	25,664	.....	37.0	1,556	2.94	75,457	R	R = rod floats.
6	77.1	26,127	.....	38.0	1,545	2.86	74,739	R	
8	76.4	25,419	.....	35.8	1,530	2.57	65,225	R	See page 20 for notes.
9	76.0	24,923	.....	35.2	1,515	2.48	61,729	R	
12	75.4	24,603	.....	34.5	1,504	2.26	55,637	R	
13	75.2	24,788	.....	36.8	1,494	2.19	54,219	R	
15	75.0	24,402	.....	37.0	1,443	2.11	51,401	R	
16	74.9	24,159	.....	36.8	1,443	2.07	50,050	R	
17	74.8	24,132	.....	36.8	1,441	2.06	49,812	R	
19	74.9	24,211	.....	36.5	1,443	2.05	49,681	R	
20	75.0	24,372	.....	36.6	1,445	2.08	50,561	R	
23	75.0	24,290	.....	36.6	1,443	2.07	50,209	R	
24	75.0	24,196	.....	36.6	1,443	2.04	49,284	R	
27	74.8	24,131	.....	36.8	1,441	2.04	49,217	R	
29	74.7	23,861	.....	36.2	1,438	1.97	46,952	R	
Sept....1	74.6	23,689	.....	36.0	1,437	1.97	46,578	R	
2	74.6	23,924	.....	36.2	1,438	1.96	46,774	R	
7	75.2	24,390	.....	36.9	1,444	2.14	52,159	R	
8	75.4	24,703	.....	37.0	1,504	2.32	57,179	R	
9	75.8	25,247	.....	37.6	1,510	2.30	58,200	R	
12	76.6	27,022	.....	38.5	1,530	2.64	71,338	R	
13	76.8	27,316	.....	39.0	1,538	2.76	75,432	R	
14	77.0	27,791	.....	39.2	1,544	2.77	76,879	R	
16	77.3	28,404	.....	39.8	1,551	2.83	80,371	R	
17	77.4	28,629	.....	40.0	1,556	2.91	82,088	R	
19	77.8	29,300	.....	40.0	1,564	2.90	84,935	R	
20	78.0	29,553	.....	40.5	1,565	2.97	87,763	R	
22	78.4	30,277	.....	40.3	1,566	3.17	96,083	R	
28	80.3	33,744	.....	42.5	1,578	3.86	130,400	R	

Mississippi River.—Grafton, Ill.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1880.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Nov... 13	15.0	30,275	.....	.....	.....	1.34	46,652	R	M = meter. F = double floats. R = rod floats.
1881.									
Jan.... 6	14.6	22,387	8.0	14.5	2,781	1.39	31,066	M	
7	14.5	21,950	7.9	14.9	2,779	1.27	27,935	M	
8	14.5	21,787	7.8	14.8	2,779	1.22	26,644	M	The discharges tabulated were measured on the Miss. River below the mouth of the Ill. River (except on 4 days which are specially noted.) The regular discharge section was about 3 miles below the mouth of the Illinois River; the location of section used from Jan. 6 to Feb. 3 is not given exactly, but was apparently between the mouth of the Illinois and the regular section. The mean area of two cross sections was used for float discharges, hence the maximum sounding is omitted except when meter was used. The gauge readings given were observed by the discharge party and when the river was frozen are corrected for thickness of ice. The zero of the gauge was 412.55 feet above the Cairo datum plane. Discharge of Mississippi River January 28th, above the mouth of the Ills. River was 26,514 cu. ft. per second.
11	14.1	20,952	7.5	14.3	2,776	1.19	24,868	M	
15	13.8	20,037	7.2	14.1	2,774	1.25	25,052	M	
17	13.9	20,375	7.3	14.1	2,775	1.33	27,046	M	
19	13 9	20,200	7.3	14.5	2,775	1.36	27,412	M	
20	13.9	20,312	7.3	14.2	2,775	1.36	27,520	M	
24	13.9	20,000	7.2	14.2	2,775	1.33	26,649	M	
25	13.9	20,062	7.2	14.1	2,775	1.34	26,882	M	
26	13.8	20,025	7.2	14.0	2,774	1.34	26,895	M	
Feb. .. 2	14.1	20,662	7.4	14.3	2,776	1.35	27,905	M	
3	14.1	20,562	7.4	14.2	2,776	1.35	27,805	M	
28	18.6	41,387	17.4	.....	2,380	2.34	96,917	F	
Mar.... 1	19.6	42,375	17.8	.....	2,380	2.30	97,637	F	
2	20.4	43,732	18.4	.....	2,380	2.64	115,588	F	
5	19.7	43,905	18.4	.....	2,380	2.38	104,460	F	
7	20.1	43,337	18 2	.....	2,380	2.58	111,951	F	
8	20.1	42,632	17.9	.....	2,380	2.88	122,736	F	
9	20.0	42,992	18.1	.....	2,380	2.71	116,105	F	
10	20.1	42,855	18.0	.....	2,380	2.82	121,017	F	
12	21.3	43,912	18.4	.....	2,385	3.22	141,612	F	
14	23.0	47,702	20.0	.....	2,390	3.36	160,311	F	
15	23.3	49,005	20.5	.....	2,390	3.33	163,293	F	
16	23.7	49,237	20.6	.....	2,392	3.54	174,129	F	
17	24.0	50,250	21 0	.....	2,392	3.44	172,892	F	
18	24.0	50,910	21.3	.....	2,392	3.34	170,223	F	
21	24.1	51,572	21.6	.....	2,392	3.36	173,147	F	
22	23.7	49,200	20.6	.....	2,391	3.41	167,701	F	
23	23.4	48,870	20.4	.....	2,390	3.36	164,426	F	
24	23.3	47,865	20.0	.....	2,390	3.32	158,811	F	
25	23.4	47,207	19.7	.....	2,390	3.25	153,496	F	
28	24.1	50,787	21.2	.....	2,391	3.51	178,253	F	
30	25.4	54,587	22.8	.....	2,395	3.97	216,556	F	
Apr.... 2	26.9	56,669	23.7	.....	2,395	3.88	220,037	F	
4	27.3	57,506	24.0	.....	2,395	4.06	233,625	F	
5	27.5	60,281	25.2	.....	2,395	3.96	238,670	F	
6	27.5	61,212	25.5	.....	2,397	4.02	246,033	F	
8	28.4	62,850	26.2	.....	2,398	3.99	251,018	F	
9	28.7	61,900	25.8	.....	2,399	4.35	267,855	F	
11	29.2	64,087	26.7	.....	2,403	4.00	256,044	F	
12	29.5	65,825	27.4	.....	2,405	4.38	288,156	F	
14	29.8	67,812	28.1	.....	2,410	4.04	273,925	F	
16	30.0	63,050	26.1	.....	2,416	4.25	268,204	F	
18	29.9	63,237	26.2	.....	2,416	4.38	276,926	F	
19	29.8	63,031	26.1	.....	2,416	4.21	265,640	F	
20	29.7	64,462	26.7	.....	2,416	4.30	277,015	F	
21	29.9	63,525	26 3	.....	2,416	4.42	280,605	F	
22	30.3	63,657	26.3	.....	2,416	4.30	273,631	F	
23	30.8	63,800	26.4	.....	2,416	4.41	281,349	F	
25	32.2	67,545	28.0	.....	2,416	4.59	310,309	F	
27	32.2	73,620	30.5	.....	2,416	4.58	337,486	F	
28	33.5	73,815	30.6	.....	2,416	4 41	325,638	F	
29	33.7	73,920	30.6	.....	2,416	4.47	330,482	F	
May.... 3	34.0	73,435	30.4	.....	2,416	4.24	311,132	F	
4	34.1	73,725	30 5	.....	2,416	4.00	295,285	F	
5	34.2	74,010	30.6	.....	2,416	3.94	291,364	F	
6	34.2	73,695	30.5	.....	2,416	3.86	284,405	F	
7	33.8	72,832	30.1	.....	2,416	3.76	274,013	F	
9	31.9	68,192	28.2	.....	2,416	4.21	287,378	F	
10	30.9	66,697	27.6	.....	2,416	4.32	287,888	F	
11	30.0	64,485	26.7	.....	2,416	4.15	267,873	F	
12	29.2	61,730	25.4	.....	2,431	4.12	254,273	F	

Mississippi River.—Grafton, Ill.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
May...13	28 8	61,495	25.3	.....	2,431	3.89	239,356	F	M = meter.
14	28.7	60,650	25.0	.....	2,428	3.98	238,118	F	F = double floats.
16	28.4	60,060	24.7	.....	2,431	3.91	234,768	F	R = rod floats.
17	28.4	61,775	25.4	.....	2,428	4.05	249,969	F	
18	28.6	.....	....	.....	.....	.....	*250,228	F	See page 22 for notes.
19	28.8	61,765	25.4	.....	2,428	4.04	249,491	F	* This is the sum of discharges of the Mississippi (216,955) and Illinois (33,273) rivers; both measured above the mouth of the Ills. This also includes discharge of a chute at the Mississippi section.
20	28 9	60,860	25.0	.....	2,431	4 12	250,547	F	
21	28.9	61,120	25.1	.....	2,434	4.13	252.620	F	
23	28 7	60,865	25.1	.....	2,427	4.22	257,167	F	
24	28.6	61,495	25.3	.....	2,427	4.08	251,115	F	
25	28.4	60,780	25.0	.....	2,427	3.94	239,597	F	
26	28.0	60,115	24.8	.....	2,425	3.90	234,255	F	
27	27.6	59,440	24.5	.....	2,422	3.72	221 050	F	
28	27.0	57,215	23.6	.....	2,423	3.59	205,585	F	
30	25.6	54,350	22.5	.....	2,419	3.48	189,243	F	
31	25.1	53,790	22.2	.....	2,419	3.26	175,112	F	
June... 1	24.6	52,580	21.7	.....	2,419	3.27	171,899	F	¶Sec'ns above mouth of Illinois River, as on May 18; Mississippi River discharge 124,163, Ills. River discharge 14,683.
2	24 2	51 590	21.3	.....	2,416	3.26	168,420	F	
3	23.9	50,735	21.0	.....	2,416	3.10	157,373	F	
4	23.6	49,940	20 7	.....	2,416	3.05	152,521	F	
6	23.2	48,610	20.1	.....	2,413	2.85	138,322	F	
7	22.8	.....	.....	.....	.....	.....	¶138,846	F	
8	22.7	47,937	19.8	.....	2,419	2.85	136,527	F	
9	22.7	47,943	19.8	.....	2,419	2.86	136,948	F	
10	23.0	48,156	19.9	.....	2,416	2.98	143,746	F	
11	23.3	49,250	20.4	.....	2,416	3.00	147,938	F	
13	24.0	50,900	21.0	.....	2,421	3.10	159,048	F	
14	24.4	51,956	21.4	.....	2,422	3.18	165,480	F	
15	24 6	52,043	21.5	.....	2,422	3.18	165,738	F	
16	24.9	52,540	21.7	.....	2,422	3.39	178,064	F	
17	25.3	52,635	21.7	.....	2,425	3.54	186,419	F	
18	25.6	53,947	22.2	.....	2,427	3.58	193,282	F	
22	26.8	55,515	22.9	.....	2,427	3.88	215,690	F	
23	27.1	56,855	23.4	.....	2,431	3.75	213,360	F	
24	27.4	58,555	24.1	.....	2,431	3 82	223,383	F	
25	27.5	57,215	23.5	.....	2,431	3.84	219,647	F	
27	27.0	57,850	23.8	.....	2 427	3.69	213,597	F	
28	26.5	54,787	22.6	.....	2,427	3.56	195,042	F	
29	26.0	54,200	22.4	.....	2,425	3.49	189,329	F	
30	25.9	53,175	21.9	.....	2,425	3.54	188,271	F	
July... 1	26.0	54,200	22.3	.....	2,427	3.61	195,582	F	
2	26.3	54,381	22.4	.....	2,427	3.69	200,626	F	
4	26.8	54,756	22.6	.....	2,427	3.64	199,199	F	
5	26.6	54,900	22.6	.....	2,427	3.58	196,512	F	
6	26.0	53,125	21.9	.....	2,427	3.46	183,771	R	
7	25.4	51,700	21.3	.....	2,425	3.20	165,301	R	
8	24.5	49,537	20.5	.....	2,422	3.02	149,850	R	
9	23.5	46,312	19.1	.....	2,419	3.05	141,254	R	
11	21.9	43,806	18 1	.....	2,416	2.68	117,175	R	
12	21.4	41,631	17.3	.....	2,411	2.67	111,340	R	
13	21.5	41,332	17.2	.....	2,410	2.69	111,081	R	
14	22.7	44,787	18.5	.....	2,419	2.91	130,343	R	
15	23.4	45,806	18.9	.....	2,419	3.10	141,826	R	
16	24.3	48,137	19.9	.....	2,421	3.19	153 676	F	
18	25.6	51,006	21.0	.....	2,431	3.44	175,284	F	
19	26.1	52,187	21.5	.....	2,431	3.60	187,963	R	
20	26.5	52,912	21.8	.....	2,428	3.80	200,905	R	
21	27.0	54,610	22.5	.....	2,427	3.81	208,061	R	
22	27.4	55,085	22.7	.....	2,427	4.16	229,284	R	
23	27.5	57,065	23.5	.....	2,427	3.97	226,416	R	
25	27.0	57,030	23.5	.....	2,427	3.84	219,202	R	
26	26.1	54,580	22.5	.....	2,422	3.76	205,291	F	
27	24.6	51,230	21.2	.....	2,422	3 18	162,735	R	
28	23.1	48,768	20.2	.....	2,413	2.86	139,300	R	

MISSISSIPPI RIVER.—GRAFTON, ILL.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
July...29	22.1	45,862	19.0	....	2,410	2.70	123,751	R	M = meter.
30	21.5	44 218	18.4	.....	2,407	2.59	114,635	R	F = double floats.
Aug.... 1	20.9	43,018	17.9	.....	2,407	2.52	108,240	R	R = rod floats.
2	20.6	.....	.....	.....	.....	.....	*106,636	R	
3	20.3	41,425	17.2	.....	2,407	2.41	99,963	R	See page 22 for notes.
4	20.1	40,725	16.9	.....	2,404	2.34	95,477	R	*Sect'ns above mouth
5	19.7	39,825	16.6	.....	2,404	2.34	92,978	R	of Illinois River as
6	19.3	38,968	16.2	.....	2,404	2.20	85,577	R	on May 18;
8	18.4	36,287	15.2	.....	2,395	1.97	71,546	R	Miss. Riv. dis. 100,966.
9	18.0	36,052	15.1	.....	2,392	1.97	70,904	R	Ills. " " 5,670.
10	17.7	34,831	14.6	.....	2,392	1.86	64,910	R	
11	17.4	33,637	14.1	.....	2,392	1.78	59,718	R	
15	16.4	31,043	13.0	.....	2,392	1.60	49,790	R	
16	16.3	31,075	13.0	.....	2,392	1.60	49,782	R	
17	16.2	30,656	12.8	.....	2,391	1.62	49,719	R	
19	16.0	31,368	13.1	.....	2,391	1.69	53,142	R	
20	16.0	31,637	13.2	.....	2,391	1.65	52,168	R	
22	16.0	31,281	13.1	.....	2,391	1.65	51,500	R	
23	16.1	31,475	13.2	.....	2,391	1.62	51,052	R	
24	16.1	31,462	13.2	.....	2,391	1.61	50,673	R	
25	16.0	31,856	13.3	.....	2,390	1.64	52,186	R	
26	15.9	31,281	13.1	.....	2,390	1 60	50,009	R	
27	15.9	30,931	12.9	.....	2,390	1.58	48,958	R	
29	15.8	30,388	12.7	.....	2,390	1.49	45,423	R	
30	15.7	30,212	12.6	.....	2,390	1.56	47,201	R	
31	15.6	30,243	12.7	.....	2,390	1.51	45,809	R	
Sept... 1	15.6	30,062	12.6	.....	2,390	1.54	46,447	R	
2	15.5	29,850	12.5	.....	2,390	1.53	45,616	R	
3	15.6	30,075	12.6	.....	2,390	1.54	46,192	R	
5	15.6	30,300	12.7	.....	2,390	1.56	47,281	R	
6	15.7	31,068	13.0	.....	2,390	1.58	48,942	R	
7	15.8	31,012	13 0	.....	2,390	1.61	49,975	R	
8	16.0	31 400	13.1	.....	2,390	1.66	51,966	R	
9	16.2	32,175	13.5	.....	2,390	1.68	53,958	R	
10	16.4	32,300	13.5	.....	2,390	1.75	56,538	R	
12	17.1	34,200	14.3	.....	2,391	1.91	65,180	R	
13	17.3	34,526	14.4	.....	2,392	1.93	66,698	R	
14	17.5	34,931	14.6	.....	2,392	1.99	69,337	R	
15	17.7	35,062	14 7	.....	2,392	2.02	70,658	R	
16	17.8	34,956	14.6	.....	2,393	2.04	71,299	R	
17	18.0	35,906	15.0	.....	2,393	2.14	76,804	R	
19	18.3	36,200	15.1	.....	2,396	2.15	77,717	R	
20	18.6	37,087	15 5	.....	2,397	2.20	81,711	R	
21	18.7	37,687	15.7	.....	2,397	2.24	84,247	R	
22	18.9	37,900	15.8	.....	2,398	2.23	84,628	R	
23	19.1	38,400	16.0	.....	2,399	2.35	90,344	R	
24	19.3	38,775	16.2	.....	2,400	2.34	90,683	R	
26	19.9	39,768	16.6	.....	2,402	2.47	98,058	R	
27	20.3	41,681	17.3	.....	2,404	2.52	105,171	R	
28	20.6	41,406	17.2	.....	2,403	2.62	108,425	R	
29	20.8	41,987	17.5	.....	2,405	2.62	109,778	R	
Oct.... 1	22.2	47,456	19.7	.....	2,410	2.96	140,479	R	
4	25.3	56,125	23.2	.....	2,418	3.49	195,896	R	

Mississippi River.—St. Louis, Mo.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1866.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Aug.... 4	12.7	.....	.....	.....	.....	.....	211		M = meter.
Oct....24	19 7	.....	.....	.....	.....	.....	3:4		F = double floats.
1872.									R = rod floats.
May....	20.4	.....	.....	.....	.....	.....	*315		I C = ice cakes.
1873.									
May 16-17	21.8	737	.....	.....	.....	5.00	369		* Approximate.
1880.									
Oct....14	10.0	318	23.3	.....	1,364	3.35	107	R & F	See page 28 for notes.
18	9.0	309	22.3	.....	1,346	3.17	95	R & F	
19	8.8	305	23.0	.....	1,328	3.12	95	R & F	
Nov.... 2	8.2	305	22.6	.....	1,349	3.07	94	F	
3	8.2	314	23.1	.....	1,361	3.04	95	F	
5	8.2	318	23.1	.....	1,374	2.99	95	F	
8	8.0	298	21.9	.....	1,360	2.99	89	F	
10	8.2	310	22 7	.....	1,364	3.11	96	F	
11	8.2	317	23.1	.....	1,373	3.21	102	F	
12	8.2	294	22 7	.....	1,297	3 31	98	F	
13	8.2	303	24.1	.....	1,260	3.17	96	F	
1881.									
Jan....12	8.6	223	14.8	.....	1,506	2.39	52	M	
14	8.4	217	14.4	.....	1,506	2.25	49	M	
15	8.6	214	14.2	.....	1,506	2.20	47	M	
17	8 6	213	14.1	.....	1,506	2.21	47	M	
18	8.6	220	14.6	33.0	1,506	2.20	48	M	
19	8.6	223	14.8	34.0	1,506	2.18	49	M	
20	8.6	221	14.6	34.0	1,506	2 33	51	M	
21	8.6	216	14.3	29.0	1,506	2.37	51	M	
22	8.5	209	13 9	29.0	1,506	2.35	49	M	
24	8.4	197	13.1	29.5	1,506	2.30	45	M	
25	8 2	206	13 7	29.5	1,506	2.32	48	M	
26	8.1	205	13.6	29.5	1,506	2.25	46	M	
27	8.0	203	13.7	29.5	1,5 6	2.20	45	M	
28	8 0	206	13.7	29.5	1,506	2.23	46	M	
29	8.0	210	14.0	29.0	1,506	2.24	47	M	
31	7.9	201	13.4	29.0	1,506	2.42	49	M	
Feb.... 1	8.0	200	13.3	29.0	1,506	2.45	49	M	
2	7.8	202	13.4	30.0	1,506	2.47	50	M	
3	7.8	200	13.3	30.0	1,506	2.40	48	M	
4	7.6	197	13.1	30.0	1,506	2.38	47	M	
5	7.6	198	13.2	29.5	1,506	2.42	47	M	
21	10.8	297	.....	.....	.....	3.74	109	I C	
22	10.6	286	.....	.....	.....	4.01	117	I C	
25	10 9	305	18 1	.....	1,649	4.27	128	R	
26	10.4	301	19.2	.....	1,555	4.03	120	R	
Mar.... 1	14.8	291	.....	.....	.....	4.73	138	I C	
2	16.0	291	.....	.....	.....	4.26	124	I C	
8	15.8	490	.....	.....	.....	4.02	197	I C	
9	15.4	490	.....	.....	.....	3.94	193	I C	
10	14.9	490	.....	.....	.....	4.12	202	I C	
12	15.4	501	23.0	.....	2,175	4.89	245	R	
14	19.4	521	23.4	.....	2,228	6.05	315	R	
16	20.1	609	.....	.....	3,135	5.73	349	R	
17	20.6	626	.....	.....	3,145	6.19	387	R	
21	21.6	618	.....	.....	3,234	5.99	370	R	
22	21.1	621	.....	.....	3,218	6.12	380	R	
23	20.6	657	.....	.....	3.235	5.72	376	R	
24	20.4	6 5	.....	.....	3,234	5.79	368	R	
25	20.6	639	.....	.....	3,233	5.63	360	R	
26	21.0	661	.....	.....	3,245	5.84	386	R	
28	20.9	610	.....	.....	3,244	5.96	363	R	
Apr... 13	27.0	841	.....	.....	3,196	5.82	489	R	
14	27.4	924	.....	.....	3,269	6.69	624	R	
15	27.6	861	.....	.....	3,290	6.47	557	R	
16	27.8	931	.....	.....	3,270	6.70	623	R	
18	27.4	925	.....	.....	3,28 6	6.41	593	R	
19	26 6	904	.....	.....	3,298	5.70	516	R	
20	26 3	847	.....	.....	3,277	6.14	519	R	

Mississippi River.—St. Louis, Mo.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Apr... 21	26.2	796	.....	.....	3,258	6.24	496	R	M = meter.
22	26.6	884	.....	.....	3,278	5.95	526	R	F = double floats;
23	27.4	920	.....	.....	3,280	6.24	574	R	R = rod floats.
25	29.2	976	.....	.....	3,280	6.14	599	R	
26	29.8	989	.....	.....	3,315	6.56	648	R	See page 28 for notes.
27	30.2	1,049	.....	.....	3,296	6.78	711	R	
28	30.6	1,059	.....	.....	3,298	6.32	669	R	
29	30.8	1,049	.....	.....	3,296	6.38	669	R	
30	31.1	1,057	.....	.....	3,275	6 37	673	R	
May.....4	33.2	1,209	.....	.....	3,345	7.41	896	R	
6	33.0	1,225	.....	.....	3,347	6.29	770	R	
9	30.0	983	.....	.....	3,331	6.01	591	R	
10	28.4	895	.....	.....	3,306	5.35	479	R	
11	27.2	865	.....	.....	3,305	5.56	481	R	
12	26.5	827	.....	.....	3,297	5.36	443	R	
16	25.3	765	.....	.....	3,295	5.10	390	R	
17	25.0	785	.....	.....	3,294	5.13	403	R	
18	25.0	783	.....	.....	3,262	5 09	399	R	
19	25.0	789	.....	.....	3,250	5.10	402	R	
20	25.0	813	.....	.....	3,272	5.16	419	R	
21	24.9	817	.....	.....	3,272	5.14	420	R	
24	24.6	786	.....	.....	3,272	5.18	407	R	
25	25.0	785	.....	.....	3,294	5.10	400	R	
26	25.0	790	.....	.....	3,251	5 31	419	R	
27	24.6	777	.....	.....	3,272	5.03	391	R	
28	23.8	741	.....	.....	3,269	5.08	376	R	
30	22.2	679	.....	.....	3,179	4.82	328	R	
31	21.6	656	.....	.....	3,153	4.74	311	R	
June .. 1	21.2	644	.....	.....	3,150	4.88	314	R	
2	20.7	658	.....	.....	3,067	4.60	303	R	
4	21.3	657	.....	.....	3,148	4.82	317	R	
6	21.8	674	.....	.....	3,184	4.88	329	R	
7	21.6	626	.....	.....	3,182	5.04	316	R	
8	21.0	643	.....	.....	3,167	5.06	325	R	
9	20.9	635	.....	.....	3,176	4.91	312	R	
10	20.9	626	.....	.....	3,145	4.80	300	R	
13	21.8	665	.....	.....	3,197	4 81	320	R	
14	22.5	694	.....	.....	3,227	5.08	353	R	
15	22.4	678	.....	.....	3,209	4.79	324	R	
16	22.3	699	.....	.....	3,205	5.16	361	R	
17	22.5	669	.....	.....	3,200	5.21	349	R	
18	22.8	690	.....	.....	3,221	4.81	326	R	
20	24.6	767	.....	.....	3,294	5.34	410	R	
22	24.5	796	.....	.....	3,272	5.50	438	R	
23	24.5	767	.....	.....	3,271	5.35	410	R	
24	24.4	739	.....	.....	3,272	5.24	388	R	
25	24.6	775	.....	.....	3,272	5.24	411	R	
28	23.7	741	.....	.....	3,244	5.50	407	R	
29	23.4	729	.....	.....	3,225	5.15	375	R	
July... 1	23.0	712	.....	.....	3,228	5.70	406	R	
2	24 0	732	.....	.....	3,271	5.46	399	R	
5	24.7	768	.....	.....	3,272	5.59	430	R	
6	24.2	729	.....	.....	3,290	5.55	404	R	
7	23.4	704	.....	.....	3,280	5.23	368	R	
11	19.0	527	.....	.....	2,127	4.89	277	R	
12	18.2	490	.....	.....	2,121	4 11	215	R	
14	18.8	530	.....	.....	2,106	4.43	250	R	
16	20.5	576	.....	.....	2,143	5.01	305	R	
18	21.6	585	.....	.....	2.172	4 58	291	R	
19	21.8	597	.....	.....	2,195	4.79	311	R	
20	22.1	607	.....	.....	3,150	4.77	314	R	
23	22.4	690	.....	.....	3,171	5.06	349	R	
26	21.2	643	.....	.....	3,097	4.88	314	R	
28	18.8	517	.....	.....	2,146	4 74	258	R	
30	16.6	479	.....	.....	2,026	4.38	214	R	

MISSISSIPPI RIVER.—ST. LOUIS, MO.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Aug... 2	15.5	454	.....	.....	2,020	4.10	186	R	M = meter.
4	14.8	433	.....	.....	1,819	4.40	191	R	F = double floats.
5	14.4	439	24.2	.....	1,811	4.08	179	R	R = rod floats.
6	14.0	432	24.1	.....	1,790	4.29	185	R	
8	13.2	407	23.2	.....	1,755	3.58	146	R	See page 28 for notes.
9	12.8	404	23.2	.....	1,741	3.40	137	R	
10	12.4	400	23.1	.....	1,731	3.21	129	R	
11	12.1	397	23.2	.....	1,714	3.41	135	R	
12	11.8	395	23.1	.....	1,712	3.54	140	R	
13	11.5	377	22.1	.....	1,705	3.29	124	R	
15	10.8	364	21.6	.....	1,683	3.22	117	R	
16	10.6	345	20.8	.....	1,659	3 31	114	R	
17	10.4	349	21.0	.....	1,665	3.16	110	R	
18	10.4	351	21.1	.....	1,665	3.12	110	R	
19	10.3	345	20.8	.....	1,662	2.97	103	R	
20	10.2	350	21.3	.....	1,644	3.08	108	R	
22	10.0	352	21.6	.....	1,635	3.01	106	R	
23	9.9	343	21 0	.....	1,635	3 17	109	R	
24	9.9	325	19.9	.....	1,635	2.92	95	R	
25	9.8	325	19.8	.....	1,641	2.92	95	R	
26	9.6	306	18.8	.....	1,633	2.88	88	R	
27	9.5	317	19.5	.....	1,624	2.94	93	R	
29	9.2	299	18.5	.....	1,614	2.86	86	F	
30	9.0	307	19 1	.....	1,603	2.82	86	R	
31	8.9	302	18.8	.....	1,605	2.81	85	R	
Sept... 1	8.8	306	19.0	.....	1,605	2.94	90	R	
2	8.8	304	18.9	.....	1,605	2.89	88	R	
3	8.6	297	18 5	.....	1,608	3.17	94	R	
5	8 8	295	18.4	.....	1,600	3.17	93	R	
6	8.8	292	18.2	.....	1,600	3.05	89	R	
7	8.8	303	18.9	.....	1,602	3 01	91	R	
9	9.1	303	18.9	.....	1,602	3.04	92	R	
10	9.3	303	18.9	.....	1,602	3.75	114	R	
12	9.8	302	18.5	.....	1,629	3.41	104	R	
						3.65	110	M	
14	10.2	316	19.5	32.0	1,620	4.01	127	M	
15	10 4	321	19.4	30.5	1,650	3.76	121	R	
						3.56	114	M	
16	10 8	318	19.0	.....	1,669	3.67	117	R	
17	11.1	318	18.9	.....	1,683	3.86	123	R	
19	11 4	323	19.0	.....	1,698	3.81	123	R	
20	11.5	340	20.1	.....	1,695	4.08	139	R	
22	11.8	340	20.1	29.5	1,695	4.33	147	R	
						4.92	167	M	
Oct....11	20.8	525	.....	45.0	3,013	5.54	991	M	
12	21.0	528	.....	45.0	3,013	5.81	307	M	
14	20.8	527	.....	44 5	3,013	5.07	267	M	
27	2 5.1	799	.....	55.5	3,305	6.82	545	M	
28	24.8	799	.....	55 5	3,280	5.80	463	M	
31	24.1	747	.....	.....	3,188	5.82	440	M	
Nov... 1	24.0	721	.....	55.0	3,188	6.35	458	M	
4	24.4	726	.....	55.5	3,229	7.62	553	M	
1892.									
May....20	35 7	1,040	54.7	78.6	1,901	9.62	*1,043	M	
21	35.2	944	53.6	85.6	1,762	12.15	1,146	F	

* 43,000 cu. ft. of this was discharge along line of railroad on left bank and mainly estimated; it s area and width are not included in this table.

Mississippi River.—St. Louis, Mo.—*Continued.*

Notes.—The gauge readings herein tabulated are all referred to the same zero, that of the U. S. Engineer gauge at foot of Market Street, St. Louis. All readings after 1873 were taken on this gauge; the gauge zero is the low water of 1863 and is 400.23 feet above the Cairo datum plane. For readings of the gauge at discharge section of 1880-1 see Report C. of E., 1883, p. 2257. The standard gauge is about 4 miles below the discharge section of 1880-1. Locations of discharge sections and authorities are as follows: The Mississippi River Commission is authority except otherwise noted. Results of measurements to 1873, inclusive, are from Report C. of E., 1873, p. 472.

Discharge of 1866 was measured by City Engineer Homer at St. Louis; the exact location not stated.

Discharges of 1872 and 1873 were measured under direction of Col J. H. Simpson; in 1872 opposite Carondelet (the southern part of St. Louis), and in 1873 below the Jefferson Barracks; the Barracks are about 2 miles below the southern limits of the city of St. Louis.

The discharge section of 1880-1 was about ½ mile above the reservoirs of the city water works in the northern part of St. Louis. The results of these observations were published in Report C. of E., 1883, p. 2257. At the higher stages of the river the discharge section included a slough on the Illinois side of the river; this slough was either full of dead water or dry at stages below about 19.5 feet on the gauge herein tabulated. At the higher stages when the slough is discharging, its width, area, and discharge are included in the quantities tabulated, and the mean velocity is derived therefrom in the usual way by dividing total discharge by total area.

The discharge section of May 20, 1892, was at the Merchants Bridge about ½ mile below the section of 1880-1. The discharge section of the following day, May 21, 1892, was at the Pittsburg dike about 4½ miles below the Merchants Bridge. The discharges of 1892 are only approximate; results in Report C. of E., 1893, p. 3682.

The northern limit of the city of St. Louis is about 5 miles below the mouth of the Missouri River; the city limits include about 19 miles of river front.

Results of Discharge Observations.

Mississippi and Ohio Rivers.—Cairo, Ill.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1858.	feet.	100sq.ft	feet.	feet.	feet.	feet.	1000 cu.ft.		
H. W....	49.6	.....	.....	.....	.....	.....	1,420	.....	F = double floats.
1891.									
Nov..† 11	2.9	584	27.5	36.8	2,122	.72	42	F	
‡ 11	2.9	85	10.6	14.3	806	5.15	44	F	
§ 11	2.9	67	7.0	14.8	930	4.25	29	F	
							114		

† Ohio River. ‡ Mississippi River, Cairo or left chute. § Mississippi River, Missouri or right chute.

Note.—Col. H. L. Abbot is authority for discharge of 1858, which is given for below the mouth of the Ohio River, see Report C. of E. 1869, p. 339. The stage is here assumed to be maximum for that year.

The 1891 discharges are printed in Report C. of E. 1892, p. 3127; the measurements were made above the mouth of the Ohio River, and their sum represents the discharge of the Mississippi River below the mouth of the Ohio. All the gauge readings were taken at Cairo and are referred to the present U. S. Engineer gauge there whose zero is 290 84 feet above the Cairo datum plane, Survey Mississippi River.

Mississippi River.—Columbus, Ky.

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1857.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Dec....11	22.1	.....	.....	.....	.....	5.74	692	F	F = double floats.
12	25.1	.....	.....	.....	.....	6.44	810	F	
14	29.6	.....	.....	.....	.....	7.05	985	F	Velocity and discharge of 1857-8 taken from "Report on the Mississippi River, by Capt A. A. Humphrey and Lieut. H. L. Abbot, 1861", p. 594, edition of 1876.
15	31.0	.....	.....	.....	.....	7 58	1,061	F	
16	32.0	.....	.....	.....	.....	7.99	1,138	F	
1858.									
Jan....12	26 0	.....	.....	.....	.....	5.24	676	F	
13	24 6	.....	.....	.....	.....	5 20	658	F	
14	23.5	.....	.....	.....	.....	4.90	606	F	
16	22.6	.....	.....	.....	.....	4.79	583	F	
18	23.2	.....	.....	.....	.....	5.01	617	F	
19	23.9	.....	.....	.....	.....	5.13	640	F	The H. and A. report does not give dimensions of the discharge section but the Delta (H. and A.) Survey drawings give 2 cross sections of the Mississippi River at Columbus, Ky., of Dec. 10th and 11th, 1857, which probably are the discharge float ranges—they are called the upper and lower sections.
20	24.3	.....	.....	.....	.....	5.25	660	F	
23	23.0	.....	.....	.....	.....	4.91	603	F	
26	20.7	.....	.....	.....	.....	4.47	538	F	
27	20.0	.....	.....	.....	.....	4.44	515	F	
29	19.3	.....	.....	.....	.....	4.42	507	F	
30	19 7	.....	.....	.....	.....	4.60	531	F	
Feb. ..3	19.3	.....	.....	.....	.....	4.42	507	F	
5	19.0	.....	.....	.....	.....	4.23	482	F	
6	18.6	.....	.....	.....	.....	4.19	474	F	
8	18.4	.....	.....	.....	.....	4.25	479	F	The upper section is 2120 feet wide, maximum sounding 78.2 feet; the lower section is 2180 feet wide, maximum sounding 77.5 feet.
11	17.8	.....	.....	.....	.....	4.14	461	F	
18	18.0	.....	.....	.....	.....	4.12	461	F	
20	18.3	.....	.....	.....	.....	4.05	455	F	
23	16.9	.....	.....	.....	.....	3.92	429	F	
24	16.3	.....	.....	.....	.....	3.70	401	F	Gauge readings are all referred to the present Mississippi River Commission gauge at Belmont, across the river from Columbus, the zero of this gauge is 286.85 feet above the Cairo datum plane.
25	15.9	.....	.....	.....	.....	3.72	399	F	
26	15 6	.....	.....	.....	.....	3.72	396	F	
Mar.... 4	19.6	.....	.....	.....	.....	4.56	525	F	
5	20.8	.....	.....	.....	.....	4.83	569	F	
9	20.3	.....	.....	.....	.....	4.57	534	F	
10	20.0	.....	.....	.....	.....	4.56	529	F	
11	20.0	.....	.....	.....	.....	4.61	539	F	
13	20.8	.....	.....	.....	.....	4.68	552	F	
16	21.7	.....	.....	.....	.....	4.87	584	F	
18	22.3	.....	.....	.....	.....	5.01	607	F	
22	31.1	.....	.....	.....	.....	6.90	981	F	
23	32.9	.....	.....	.....	.....	7.34	1,059	F	
24	34.2	.....	.....	.....	.....	7.46	1,098	F	
25	35.2	.....	.....	.....	.....	7.40	1,106	F	
26	36.0	.....	.....	.....	.....	7.47	1,130	F	
29	36.7	.....	.....	.....	.....	7.24	1,105	F	
Apr.... 1	35.3	.....	.....	.....	.....	7.08	1,059	F	
2	34.0	.....	.....	.....	.....	6.89	990	F	
3	32.2	.....	.....	.....	.....	6.63	947	F	
5	28.0	.....	.....	.....	.....	5.82	778	F	
6	25.8	.....	.....	.....	.....	5.51	710	F	
7	23.9	.....	.....	.....	.....	5.00	623	F	
9	21.3	.....	.....	.....	.....	4.77	568	F	
14	25.2	.....	.....	.....	.....	5.35	682	F	
15	27.5	.....	.....	.....	.....	6.04	800	F	
20	33.2	.....	.....	.....	.....	7.11	1,031	F	
21	34.8	.....	.....	.....	.....	7.31	1,086	F	
22	36.4	.....	.....	.....	.....	7.37	1.120	F	
24	38.7	.....	.....	.....	.....	8.02	1,261	F	
27	39.3	.....	.....	.....	.....	7.80	1,237	F	
30	38.1	.....	.....	.....	.....	7.15	1,113	F	
May.... 1	36.9	.....	.....	.....	.....	6.85	1,050	F	
4	31.5	.....	.....	.....	.....	5.69	803	F	
5	30.0	.....	.....	.....	.....	5.69	787	F	
6	28.8	.....	.....	.....	.....	5.76	779	F	
7	28.3	.....	.....	.....	.....	5.79	777	F	
8	28.4	.....	.....	.....	.....	5 85	787	F	
11	31.4	.....	.....	.....	.....	6.31	889	F	
12	33.0	.....	.....	.....	.....	6.61	955	F	
13	33.6	.....	.....	.....	.....	6.65	970	F	
14	34 2	.....	.....	.....	.....	6.83	1,005	F	

MISSISSIPPI RIVER.—COLUMBUS, KY.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1858.	feet.	100 sq.ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
May....17	35.0	.....	.....	.....	.....	6.80	1,011	F	F = double floats.
18	35.0	.....	.....	.....	.....	6.77	1,008	F	
19	34.9	.....	.....	.....	.....	6.76	1,005	F	See page 29 for notes.
21	34.7	.....	.....	.....	.....	6.66	982	F	
25	36.2	.....	.....	.....	.....	7.11	1,078	F	
26	37.4	.....	.....	.....	.....	7.22	1,114	F	
27	37.9	.....	.....	.....	.....	7.29	1,133	F	
29	38.3	.....	.....	.....	.....	7.29	1,140	F	
June... 1	38.4	.....	.....	.....	.....	7.31	1,143	F	
2	38.4	.....	.....	.....	.....	7.35	1,151	F	
3	38.6	.....	.....	.....	.....	7.40	1,161	F	
7	39.9	.....	.....	.....	.....	7.55	1,206	F	
8	40.1	.....	.....	.....	.....	7.63	1,222	F	
9	40.4	.....	.....	.....	.....	7.69	1,241	F	
12	41.1	.....	.....	.....	.....	7.88	1,281	F	
14	41.8	.....	.....	.....	.....	8.04	1,318	F	
15	42.1	.....	.....	.....	.....	8.19	1,349	F	
16	42.3	.....	.....	.....	.....	8.40	1,388	F	
17	42.5	.....	.....	.....	.....	8.47	1,403	F	
18	42.7	.....	.....	.....	.....	8.45	1,408	F	
19	42.7	.....	.....	.....	.....	8.43	1,400	F	
22	42.9	.....	.....	.....	.....	8.31	1,383	F	
25	42.2	.....	.....	.....	.....	7.80	1,286	F	
26	41.8	.....	.....	.....	.....	7.67	1,259	F	
28	40.0	.....	.....	.....	.....	7.23	1,157	F	
29	38.7	.....	.....	.....	.....	6.94	1,090	F	
30	37.0	.....	.....	.....	.....	6.50	997	F	
July... 1	35.3	.....	.....	.....	.....	5.62	841	F	
2	32.8	.....	.....	.....	.....	5.14	740	F	
3	30.8	.....	.....	.....	.....	4.81	671	F	
5	28.0	.....	.....	.....	.....	4.63	619	F	
6	26.8	.....	.....	.....	.....	4.60	602	F	
7	25.7	.....	.....	.....	.....	4.42	568	F	
8	24.9	.....	.....	.....	.....	4.21	533	F	
9	24.2	.....	.....	.....	.....	3.99	500	F	
12	22.6	.....	.....	.....	.....	3.92	477	F	
13	22.4	.....	.....	.....	.....	3.83	464	F	
14	22.4	.....	.....	.....	.....	3.84	466	F	
15	22.2	.....	.....	.....	.....	3.81	460	F	
16	21.9	.....	.....	.....	.....	3.69	443	F	
17	21.6	.....	.....	.....	.....	3.55	425	F	
19	21.9	.....	.....	.....	.....	3.70	445	F	
20	22.7	.....	.....	.....	.....	4.04	493	F	
21	24.3	.....	.....	.....	.....	4.15	521	F	
22	25.7	.....	.....	.....	.....	4.64	596	F	
24	26.8	.....	.....	.....	.....	4.88	639	F	
26	27.9	.....	.....	.....	.....	4.99	665	F	
27	28.2	.....	.....	.....	.....	4.97	665	F	
28	28.2	.....	.....	.....	.....	4 96	664	F	
29	27.9	.....	.....	.....	.....	4.96	662	F	
30	27.4	.....	.....	.....	.....	4.64	614	F	
31	26.3	.....	.....	.....	.....	4.53	589	F	
Aug.... 2	24.4	.....	.....	.....	.....	4.22	532	F	
3	23.8	.....	.....	.....	.....	4.13	514	F	
4	23.2	.....	.....	.....	.....	4.00	493	F	
5	22.7	.....	.....	.....	.....	3.93	480	F	
6	22.5	.....	.....	.....	.....	3 94	479	F	
7	22.3	.....	.....	.....	.....	3.97	480	F	
9	22.9	.....	.....	.....	.....	4.05	496	F	
10	23.1	.....	.....	.....	.....	4.05	496	F	
11	22.9	.....	.....	.....	.....	4.14	495	F	
12	22.7	.....	.....	.....	.....	3.93	480	F	
13	22.2	.....	.....	.....	.....	3.87	468	F	
14	21.8	.....	.....	.....	.....	3.90	468	F	
16	20.9	.....	.....	.....	.....	3.66	432	F	
17	20.6	.....	.....	.....	.....	3.75	411	F	
18	20.3	.....	.....	.....	.....	3.35	391	F	

MISSISSIPPI RIVER.—COLUMBUS, KY.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1858.	feet.	100sq.ft	feet.	feet.	feet.	feet.	1000 cu.ft.		
Aug....19	19.9					3.33	385	F	F = double floats.
20	19.5					3 33	383	F	
21	18.9					3.28	369	F	See page 29 for notes.
23	17.9					3.26	364	F	
24	17.3					3.08	340	F	
25	16.7					3.05	333	F	
26	15 9					2.80	300	F	
27	15.7					2.75	294	F	
30	15.0					2.55	268	F	
Sept.... 2	14.7					2.67	280	F	
4	13.9					2.49	257	F	
6	12.9					2.33	235	F	
7	12.4					2.29	228	F	
8	11.9					2.24	221	F	
9	11.5					2.24	219	F	
10	11.2					2.28	222	F	
11	11.0					2.18	212	F	
13	11.1					2.17	211	F	
14	12.4					2.48	247	F	
15	13.4					2.51	256	F	
16	13.5					2.60	266	F	
17	13.5					2.50	256	F	
18	13.2					2.50	254	F	
20	12.7					2.48	249	F	
21	12.3					2.39	238	F	
22	11.9					2.36	238	F	
23	11.4					2.23	223	F	
24	10.8					2.22	214	F	
27	9.3					1.98	185	F	
29	8.8					1.96	181	F	
30	8.5					1.90	174	F	
Oct.... 1	8.3					1.94	177	F	
2	8.1					1.78	162	F	
4	7.7					1.77	159	F	
6	7.3					1.67	149	F	
8	6.8					1.66	146	F	
9	6.7					1.66	146	F	
11	6.2					1.62	141	F	
12	6.0					1.67	144	F	
13	5.9					1.56	134	F	
14	5.8					1.59	137	F	
15	5.6					1.55	133	F	
16	5.5					1.51	129	F	
18	5.3					1.56	130	F	
19	5.2					1.58	134	F	
20	5.1					1.60	136	F	
21	5.1					1.54	131	F	
22	5.2					1.58	134	F	
23	5.2					1.56	132	F	
25	5.4					1.55	132	F	
26	5.5					1.58	135	F	
28	5.7					1.64	140	F	
29	5.9					1 62	140	F	
30	5.9					1.67	144	F	
Nov... 3	10.0					2.49	236	F	
4	11.3					2.92	285	F	
5	13.8					3.45	354	F	
8	18.0					3.95	442	F	
9	17.9					3.89	434	F	
10	17.6					3.79	420	F	
11	17.4					3.78	417	F	
12	17.0					3.65	400	F	
16	15.0					3.40	358	F	

Mississippi River.—Columbus, Ky.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1879.	feet.	100sq.ft	feet.	feet.	feet.	feet.	100 cu.ft.		
Feb....28	22.8	1,215	.....	.....	.....	4 23	514	F	F = double floats.
Mar.... 1	22.4	.....	52.49	.....	2,410	.. ..	.....	.....	
3	21.6	1,187	....	.....	.....	3.92	465	F	The observations of 1879 were made under direction of Major C. R. Suter, at request of Board of Engineers on Low Water Navigation of Mississippi River; the results will appear in Report C. of E. 1884.
6	21.2	1,182	.....	.....	.....	4.06	480	F	
7	21.3	1,183	.....	.....	.....	4.06	480	F	
8	21.4	1,183	.....	.....	.....	4.09	476	F	
9	21.3	1,180	.....	.....	.....	3 97	469	F	
10	20.9	1,171	.....	.....	.....	4.09	479	F	
11	20.7	1,166	.....	.....	.....	4 07	474	F	
12	20.7	1,164	.....	.. ....	.....	3.94	459	F	
15	23.0	1,220	.....	.....	.....	4.40	537	F	
18	25 1	1,342	56.00	.....	2,410	4.82	647	F	
20	26.2	1,362	55.45	.....	2,410	4.95	675	F	Gauge readings are referred to present Mississippi River Commission gauge at Belmont.
21	26.5	1,377	56.14	.....	2,400	4.91	676	F	
25	28.4	1,377	53.64	.....	2,400	5 26	724	F	
26	29.1	1,387	54.38	.....	2,370	5.37	745	F	
27	29.4	1,398	53.34	.....	2,400	5.34	746	F	
28	29.3	1,410	54 73	.....	2,400	5.26	742	F	The discharge section of 1879 is about 1,600 feet above the railroad depot at the lower end of the town of Columbus, and about 1,300 feet above the section of 1893
29	29.2	1,426	55.24	.....	2,400	5.26	750	F	
31	28.7	1,383	54.26	.....	2,400	5.29	732	F	
Apr.... 2	28.4	1,423	55.69	....	2,400	5.16	734	F	
4	28.4	1,392	52.68	....	2,470	5.08	705	F	
6	28.8	1,385	52.48	.....	2,460	5.30	734	F	
8	28 4	1,374	52 95	.....	2,450	5.25	722	F	
11	26.5	1,334	52.63	.....	2,450	4.78	631	F	
12	26.3	.....	53.12	.....	2,450	.....	.....	F	
13	27.2	1,383	54.26	.....	2,450	5.05	699	F	
14	27.8	1,311	51.02	.....	2,450	5.09	667	F	
19	27.8	1,341	52.20	.. ....	2,450	4.86	652	F	
20	27.5	1,329	51.98	.....	2,450	4.98	662	F	
21	27.3	1,311	51.98	.....	2,430	5.00	655	F	
22	26.6	1,338	53.10	.....	2,440	4.72	631	F	
23	26.0	1,312	51.44	.....	2,450	4.96	651	F	
24	25.1	1,251	51.06	.....	2,450	4 42	553	F	
25	24.0	1,244	51.89	.....	2,450	4.18	520	F	
27	22.0	1,207	52.48	.....	2,450	4.05	490	F	
28	21.1	1,196	52.81	.....	2,450	3.90	466	F	
29	20.4	1,172	52.71	.....	2,450	3.77	442	F	
30	19.6	1,138	51.32	.....	2,450	3.77	429	F	
May... 1	18.8	1,118	52.20	.....	2,450	3.63	405	F	
2	18.0	1,110	52.66	.....	2,450	3.38	375	F	
6	15.2	1,002	50.86	.....	2,450	2.98	298	F	
7	14.6	989	50.69	.....	2,450	2 97	293	F	
8	14.1	992	51.91	.....	2,450	2.94	291	F	
9	13.6	939	49.96	.....	2,450	2.77	265	F	
10	13.3	1,002	51.98	.....	2,450	2.58	259	F	
12	13 0	954	49.72	.....	2,450	2.65	253	F	
14	13.0	963	50.93	.....	2,450	2.65	255	F	
15	12.8	995	52.93	....	2,450	2.74	273	F	
16	12.5	969	52.40	.....	2,450	2.73	265	F	
17	12.3	975	52.68	.....	2,450	2.67	260	F	
18	12.2	964	51.67	.....	2,450	2.63	253	F	
19	12.2	962	50.80	.....	2,450	2.65	255	F	
20	12.2	956	52.02	.....	2,450	2.63	251	F	
21	12.1	981	52.55	.....	2,450	2.63	259	F	
22	11.8	960	51.72	.....	2,450	2.69	255	F	
23	11.4	940	51.80	.....	2,450	2.60	244	F	
24	11.2	930	51.63	.....	2,450	2.49	224	F	
25	11.2	932	51.43	.....	2,450	2.47	230	F	
26	11.2	927	51.21	....	2,450	2 45	227	F	
27	11.3	965	52.62	.....	2,450	2.51	242	F	
28	11.2	945	52.29	.....	2,450	2.50	236	F	
29	11.3	954	52.42	.....	2,450	2 50	238	F	
30	11.7	943	51.37	.....	2,450	2.57	243	F	

Mississippi River.—Columbus, Ky.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1879.	feet.	100sq.ft	feet.	feet.	feet.	feet.	1000 cu.ft.		
June... 2	14.2	1,036	53.03	.....	2,450	3.07	318	F	M = meter.
3	14.8	1,046	52.40	.....	2,450	3.10	324	F	F = double floats.
4	15.2	1,057	53 23	.....	2,450	3.02	319	F	R= rod floats.
5	15.7	1.034	51.84	.....	2,450	3.19	330	F	
6	16.3	1,094	52.43	.....	2,440	3.30	362	F	The 1881-2 series is printed in the Report C. of E., 1884, p. 2607.
7	16.6	1,080	53.02	.....	2,440	3.22	348	F	
8	16.4	1,090	52.80	.....	2,445	3.32	361	F	
9	16.3	1,060	51.81	.....	2,440	3.30	350	F	
10	16.2	1,075	52.05	.....	2,450	3.25	349	F	The discharge section of this series is about 2500 feet above the railroad depot and about 2200 feet above the section of 1893.
11	16.2	1,083	52.71	.....	2,450	3.21	348	F	
12	16.0	1,053	51.85	.....	2,450	3.21	338	F	
13	15.6	1,059	52.64	.....	2,450	3 17	336	F	
14	15.4	1.048	52.35	.....	2,450	3.05	320	F	
15	15 5	1,049	52.47	.....	2,450	3.09	324	F	
16	15.6	1,053	51.08	.....	2,450	3.20	337	F	
17	15.6	1,052	52.16	.....	2,450	3.11	328	F	The gauge readings are referred to the present M. R. C. gauge at Belmont.
18	15.5	1,064	53.06	.....	2,450	3.12	332	F	
19	15.4	1,041	52.16	.....	2,450	3.23	336	F	
20	15.4	1,054	51.30	.....	2,450	3.08	324	F	
21	15.6	1,047	52.00	.....	2,450	3.08	322	F	
23	16.5	1,059	52.11	.....	2,450	3 41	361	F	
24	16.6	1,090	52.82	.....	2,450	3.32	362	F	
25	16.4	1,062	51.32	.....	2,450	3.35	356	F	
27	15.7	1,038	52.03	.....	2,450	3.17	329	F	
28	15.3	1,052	52.82	.....	2,450	3.22	339	F	
30	16.2	1,042	51.39	.....	2,450	3 22	336	F	
July... 1	17.2	1,081	51.52	.....	2,450	3.62	391	F	
2	18.0	1,093	.....	.....	.....	3.75	410	F	
1881.									
Dec....17	19.2	1,264	50.3	66.4	2,526	3.46	437	F	
21	20.0	1,406	55.2	73.8	2,544	5.06	711	F	
22	27.8	1,434	56.1	74.4	2,556	5.29	758	F	
23	29.0	1,485	57.9	76 8	2,566	5.55	824	F	
24	30.1	1,539	59.8	80.8	2,575	5.67	872	F	
28	35.5	1,721	65.3	87.2	2,633	6.53	1,123	F	
29	36.1	1.741	66.0	87.9	2,641	6.10	1,062	R	
30	36.3	1,734	65 4	86.9	2,650	6.15	1,066	R	
31	36.3	1,707	66.7	89.5	2,650	6.27	1,109	R	
1882.									
Jan.... 3	35.6	1,862	68.1	91.2	2,615	5.91	1,064	R	
5	35.3	1,745	66.1	95.5	2,640	5.75	1,004	R	
6	35.1	1,727	65.5	86.1	2,637	5.74	992	R	
9	34.1	1,658	63 0	88.0	2,632	5.47	907	R	
11	34.3	1,682	63.8	89.0	2,633	5.63	950	R	
14	36 7	1,724	64.8	91.5	2.659	6.30	1,086	R	
17	39.2	1,789	67.1	92.0	2,668	7.36	1,317	R & F	
18	39.7	1,834	68 6	92.0	2,671	7.45	1,366	F	
19	40.2	1,816	68.0	94.4	2,672	7.43	1,349	F	
20	40.6	1,848	70.0	95.6	2,672	7.49	1,385	R	
25	41.9	1,794	66.6	91.5	2,693	7.61	1,364	R	
26	42.1	1,824	67.8	95.0	2,694	8.02	1,463	R	
27	42.2	1,846	68.5	94.0	2,694	7.96	1,469	*M	* Meter velocities observed at mid depth and not corrected.
30	42.3	1,835	68.1	91.0	2,695	7.47	1,370	*M	
Feb.... 1	42.4	1,808	66.9	91.0	2,695	7.61	1,373	*M & R	
2	42.4	1,747	65.1	83.0	2,695	8.05	1,407	*M	
3	42.3	1,822	67.5	90.0	2,697	7.40	1,348	R	
4	42.4	1,850	68.6	89.5	2,697	7.72	1,429	R	
6	42.2	1,823	67.5	91.2	2,701	7.25	1,322	R	
7	42.0	1,819	67.4	87.0	2,699	7.52	1,367	R	
8	41.9	1,909	70.8	95 0	2,697	7.43	1,418	R	
9	41.6	1,890	70.1	97.5	2,694	7.40	1,399	R	
10	41.4	1,885	70.1	93.5	2,689	7.04	1,326	R	
11	41.0	1,885	70.2	94.5	2,684	6.84	1,289	R	
13	40.4	1,886	70.3	95.0	2,682	6.59	1,243	R	
14	40.4	1,850	69.0	92.5	2,681	6.65	1,230	R	
15	40.2	1,933	71.9	94.5	2,680	6.48	1,253	R	

MISSISSIPPI RIVER.—COLUMBUS, KY.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Feb....18	41.0	1,869	69.7	93.0	2,681	6.81	1,272	*M	M = meter.
22	43.6	1,970	72.9	99.5	2,689	8.14	1,603	R	F = double floats.
28	44.9	1,919	71.2	101.0	2,694	8.12	1,558	R	R = rod floats.
Mar.... 1	44.7	1,822	68 4	100.5	2,649	8.24	1,502	R	
2	44.3	1,806	71.4	94.0	2,649	8.02	1,521	R	
3	44.2	1,889	71.3	98.0	2,649	8.04	1,518	R	
4	44.0	1,865	70.0	98.0	2,649	7.84	1,463	R	
6	43.4	1,861	70.1	95.5	2,654	7.52	1,430	R	
7	43.1	1,840	69.3	89.5	2,653	7.62	1,408	R	
8	42.9	1,806	68 4	89.5	2,641	7.69	1,390	R	
10	42.5	1,818	68.8	90.5	2,641	7.22	1,324	R	
11	42.4	1,786	67.7	88 5	2,639	7.35	1,313	R	
13	42.5	1,851	70.0	92.5	2,644	7.35	1,361	R	
14	42.6	1,858	70.2	92.5	2,646	7.09	1,317	R	
15	42.7	1,860	70.3	89.0	2,646	7.42	1,386	R	
16	42.6	1,858	70.2	92.0	2,646	7.35	1,366	R	
17	42.4	1,876	70.9	88.5	2,645	7 14	1,339	R	
21	41.1	1,829	68.7	84.0	2,635	6.39	1,168	M	
22	40.5	1,875	71 2	90.0	2.634	6 09	1,142	M	
23	39.8	1,824	69.3	86.0	2,632	5.77	1,053	M	
24	39.1	1,852	69.1	87.0	2,630	5.81	1,065	M	
25	38.6	1,768	67.3	82.0	2,627	5.46	966	M	
27	38.2	1,789	68.1	82 0	2,625	5.60	1,001	M	
28	38 1	1,789	68.1	82.0	2,624	5.43	972	M	
29	38.1	1,798	68.5	82.0	2,624	5.51	991	M	
30	38.2	1,805	68.7	84.0	2,628	6.05	1,092	M	
April.. 1	38.4	1,814	69.0	86.0	2,630	5 90	1,070	M	
3	38.2	1,809	68.7	86.0	2,631	5.94	1,075	M	
4	37.6	1,786	68.0	86.0	2,628	5.75	1,027	M	
5	36.7	1,777	67.7	85.0	2,625	5.49	976	M	
6	35.2	1,723	65.8	84.0	2,619	5.22	899	M	
8	31.9	1,625	62.7	79.0	2,589	4.76	773	M	
10	32.1	1,643	63.5	81.0	2,589	4.89	803	M	
11	32.2	1 640	63.3	80.0	2,590	4.84	793	M	
12	32.2	1,647	63.6	81.0	2,590	4.94	813	M	
13	32.0	1,649	63.7	80.0	2,590	4.77	786	M	
14	31.7	1,629	63.0	80.0	2,590	4.74	772	M	
15	31.7	1,629	63.0	80.0	2,590	4.78	779	M	
17	32.2	1,623	62.7	80.0	2,590	4.90	795	M	
18	32.2	1,636	63.0	80.0	2,595	4.95	810	M	
19	31.7	1,609	62.1	77.5	2,591	4.41	709	R	
20	30.8	1,570	60.9	75.0	2,578	4.43	695	R	
21	29.8	1,543	60.0	78.0	2,570	4.59	708	M	
22	29.1	1,521	59.5	79.0	2,558	4.32	656	M	
24	27.6	1,487	58.6	74.0	2,538	4.31	640	M	
25	27.6	1,508	59.4	75.0	2,538	4.37	658	M	
26	28.0	1,519	59.8	74.0	2,540	4.20	638	M	
27	28.4	1,510	59.1	75.0	2,553	4.15	627	M	
29	29.2	1,536	60.1	74.5	2,557	4.19	644	R	
May... 1	29.7	1,535	59.8	74.1	2,566	4.30	661	R	
2	29.9	1,548	60.3	76.0	2,568	4.62	715	M	
3	30.0	1,546	60.2	77.0	2,570	4 50	695	M	
4	30.0	1,589	61.7	76.0	2,575	4.56	725	M	
5	29.8	1,568	61.0	76.0	2,572	4.43	695	M	
6	29.5	1,538	59.9	77.0	2,568	4.54	699	M	
8	28.6	1,485	57.9	74.0	2,565	3.88	577	M	
9	29.8	1,598	61.8	76.0	2,585	4.77	762	*M	* Velocities observed at middepth and not corrected.
10	32.8	1,610	62.1	78.0	2,592	5 32	857	M	
11	34.8	1,706	65.6	81.5	2,608	4.99	851	R	
12	36.4	1,717	65.8	87.0	2,609	5.40	928	R	
13	37.8	1,810	60.0	90.0	2,624	5.55	1,004	R	
15	38.5	1,811	69 0	87.5	2,627	5.79	1,049	R	
16	38.5	1 814	69.1	88.5	2,627	5.74	1,041	R	
17	38.4	1,817	69.2	88.0	2,627	5.57	1,012	R	
18	38.3	1,755	66.7	86.5	2,632	5 63	999	R	

Mississippi River.—Columbus, Ky.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1892.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
May....19	38.4	1,782	67.6	86.0	2,635	5.84	1,041	M	M = meter.
20	38.4	1,748	66.3	85.0	2,635	5.85	1,022	*M	F = double floats.
22	38.9	1,801	68.3	88 0	2,636	6.05	1,090	M	R = rod floats.
23	39.0	1,791	67.9	85.0	2,636	6.21	1,111	*M	
25	38.2	1,781	67.6	84.0	2,635	5.91	1,052	M	*Meter velocities observed at middepth and not corrected.
26	37.4	1,750	66 5	84.0	2,632	5.60	980	M	The discharges of 1891 to '93 were all measured at the same place except that the Missouri end of section was moved upstream about 60' in 1893. This location is about 300 feet above the railroad freight depot in Columbus, and about 2200 feet below the section of 1881-82. The 1891 series is printed in Report C. of E. 1892, p. 3127; the '92 series, in Report C. of E., 1893, p. 3682. The 1893 series will appear in Rept. C. of E. for 1894.
27	36.2	1,710	65.2	81.0	2,621	5.25	898	M	
29	34.6	1,697	64.9	81.0	2,613	5.20	883	M	
30	34.6	1,681	64 3	81.0	2,613	5.33	896	*M	
31	35.6	1,725	66.0	84.0	2,616	5.53	954	*M	
June... 1	36.5	1,747	66.5	86.0	2,626	5.78	1,011	M	
2	37.3	1,754	66.0	84.0	2,632	5.93	1,041	M	
3	37 8	1,806	68 5	87.0	2,635	5.96	1,071	M	
5	38.5	1,784	67.6	86.0	2,637	6.16	1,089	M	
7	38.6	1,798	68.4	86.5	2,627	5.47	963	R	
8	38.6	1,799	68.5	85.5	2,627	5.48	986	R	
9	38.4	1,785	67.9	86.0	2,627	5.49	980	R	
10	38.0	1,761	67.1	80.0	2,622	5.67	999	M	
12	36 5	1,696	65.1	82.5	2,622	5.09	863	R	
13	35.5	1,706	65.6	.....	2,600	4.94	843	R&M	
14	34 2	1,683	64.9	80.0	2,593	4.60	775	R	
15	32.5	1,622	62.8	78.5	2,584	4.38	710	R	
16	31 3	1,590	61.6	76.5	2,580	4 21	669	R	
17	30.4	1,560	60.8	76 0	2,564	4.12	644	R	
19	31.6	1,571	60.8	79.0	2,579	4.76	748	R	
20	33.4	1,632	63.0	81.5	2,589	4.94	806	R	The gauge readings given are all as observed on the Belmont gauge by the discharge parties.
21	34.7	1,662	64.0	80.8	2,598	4.96	824	R	
22	35.2	1,682	64.5	81.5	2,604	4.95	832	R	
23	35.5	1,688	64.8	83 0	2,605	5.38	909	M	
24	35.8	1,669	64.1	83.0	2,605	5.39	900	*M	
27	35.1	1,648	63.8	88.0	2,604	4.98	820	M&R	The zero of this gauge to 1890 was 287.14 ft. above the Cairo datum plane. In Nov., 1892, the low water section was found to be at this elevation but the upper sections were 286.88 ft. above the Cairo datum and the low water section was changed to agree with the upper ones; the gauge has been maintained at the same elevation since 1892. By precise level connection with P. B. M. 10 in May, 1894, the gauge zero was found to be 286.85 feet above the Cairo datum plane.
28	34.3	1,670	64.4	85.0	2,593	5.14	859	*M	
29	33.7	1,650	63.1	83.0	2,585	4.89	797	M	
30	33 1	1,594	61.7	83.0	2.580	4.82	768	*M	
July... 1	33.1	1,625	63 0	88.0	2,580	4.94	802	M	
3	33.5	1,624	63 0	80.0	2,585	5.05	820	M	
5	34.8	1,708	65.8	82 0	2,596	4 85	828	M	
6	35 4	1,699	65.3	86.0	2,601	5.05	858	M	
7	35.9	1,713	65.7	84.5	2,601	5.39	923	M	
8	36.3	1,684	64.2	86.0	2,608	5.33	898	M	
10	36.1	1,662	63.8	82.0	2,602	5.36	891	M	
11	35.8	1,673	64 4	85.0	2,600	5.37	899	M	
12	35.2	1,685	64 8	84.0	2,599	5 32	896	M	
13	34.4	1,606	61.9	82.0	2,593	5.08	816	M	
14	33.2	1,608	62.2	80.0	2,592	4.86	781	M	
15	32.2	1,582	61.3	78.5	2,579	4.80	750	M	
17	30.4	1,523	59.7	78.0	2,552	4.53	690	M	
18	29.8	1,500	59.2	78.0	2,536	4.31	647	M	
19	29.0	1,467	58 5	76.0	2,527	4.33	636	M	
20	28.4	1,472	58.4	77.0	2,519	4.09	601	M	
21	27.7	1,431	57 2	74.5	2,508	3.99	572	M	(Gauge notes continued on the following page)
22	27.4	1,406	56.5	76.0	2,497	3.95	579	M	
24	26.2	1,381	55.4	73.0	2,491	3.83	529	M	
25	25.5	1,384	55.7	72.0	2,484	3.69	510	M	
26	24.4	1,347	54.4	71.0	2,477	3.56	479	M	
27	23 3	1,305	53.0	71.0	2,461	3.27	426	M	
28	22.4	1,294	52 6	68.5	2,460	3.23	418	M	
29	21.7	1,266	51 6	68.0	2,455	3.10	392	M	
30	21.2	1,220	49.6	66.0	2,457	2.97	362	M&R	
Aug.... 2	20.0	1,257	51.1	65.5	2,457	2.57	323	R	
3	19.8	1,271	51.7	65.5	2,456	2.54	323	R	
4	19.5	1,226	49.8	64.2	2,462	2.48	304	R	
5	19.5	1,238	50.1	64.2	2,461	2.57	316	R	
7	21.3	1,371	55.6	72.0	2,464	3.05	418	M	
8	21.9	1,336	54.2	72 5	2,466	3 14	420	*M	

MISSISSIPPI RIVER.—COLUMBUS, KY.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Aug....9	22.0	1,374	55.6	72.0	2,470	3.22	442	M	M = meter.
10	21.7	1,330	53.9	70.5	2,468	3.14	418	M	F = double floats.
11	21.5	1,315	53.4	71.5	2,464	3.07	404	*M	R = rod floats.
12	21.3	1,338	54.4	69.5	2,462	3.00	402	M	
14	20.7	1,272	51.8	69.0	2,456	2.97	378	M	*Meter velocities observed at middepth and not corrected.
15	20.2	1,254	51.2	68.0	2,451	2.91	363	M	
16	19.9	1,270	51.9	68.0	2,447	2.82	358	M	
17	19.7	1,267	51.8	68.0	2,446	2.76	349	M	From 1857 to 1882, inclusive, the gauges of the discharge parties were at different elevations and to reduce them to the present M. R. C. gauge at Belmont, whose zero is 286.85' above the Cairo datum plane, corrections were applied to original readings of gauges as follows: H. and A's gauge, 1857-8, 2 feet have been added; Maj. Suter's gauge, 1879, 5.05 feet have been subtracted; M. R. C. gauge, 1881-2, 57.7 feet have been subtracted. No correction has been applied to 1881-2 series.
18	19.5	1,252	51.1	68.0	2,447	2.70	338	M	
19	19.2	1,222	50.0	66.0	2,451	2.71	332	M	
21	18.5	1,217	49.7	67.5	2,447	2.59	316	M	
22	18.0	1,229	50.1	65.0	2,451	2.26	278	R	
23	17.6	1,224	50.1	67.0	2,442	2.49	304	M	
24	17.0	1,218	49.9	66.0	2,440	2.30	280	M	
25	16.3	1,191	46.7	65.0	2,440	2.31	275	M	
26	15.9	1,169	48.0	64.5	2,438	2.23	261	M	
28	15.1	1,160	47.7	65.0	2,433	2.14	249	M	
29	14.9	1,151	47.4	63.8	2,430	1.90	219	R	
30	14.7	1,155	47.5	63.5	2,428	1.87	216	R	
31	14.7	1,158	46.8	62.0	2,428	2.12	242	M	
Sept.....1	14.7	1,172	48.2	63.0	2,432	2.06	242	M	
2	14.9	1,158	47.5	64.0	2,433	2.15	249	M	
4	15.1	1,131	46.4	63.5	2,440	2.25	254	M	
5	15.3	1,156	47.4	64.0	2,440	2.19	253	M	
6	15.4	1,162	47.6	64.5	2,441	2.13	247	*M	
7	15.7	1,158	47.4	64.0	2,443	2.07	239	M	
8	16.0	1,176	48.0	65.0	2,443	2.24	261	M	
9	16.1	1,162	47.6	65.0	2,443	2.30	267	M	
11	15.9	1,173	48.0	63.0	2,441	2.23	261	M	
12	15.6	1,213	49.7	63.2	2,440	1.93	234	R	
13	15.3	1,153	47.3	63.0	2,438	2.13	245	M	
14	14.8	1,118	45.9	63.0	2,435	2.07	232	M	
15	14.6	1,121	46.1	62.0	2,433	2.04	229	M	
16	14.4	1,122	46.2	62.0	2,429	2.09	234	M	
18	16.1	1,187	48.7	64.0	2,439	2.35	279	M	
19	17.0	1,184	48.5	64.2	2,442	2.23	264	R	
20	17.9	1,220	49.7	66.0	2,454	2.65	323	M	
21	18.1	1,211	49.3	67.0	2,455	2.65	321	M	
22	17.5	1,216	49.6	65.5	2,450	2.51	305	M	
23	16.6	1,188	48.6	65.5	2,445	2.35	279	*M	
25	15.3	1,152	47.3	63.5	2,435	2.24	258	M	
26	14.4	1,124	46.2	62.0	2,429	2.17	244	M	
27	13.7	1,128	46.5	62.0	2,425	2.03	229	M	
28	12.8	1,104	45.6	61.0	2,423	1.97	217	M	
29	12.3	1,080	44.6	60.0	2,421	1.90	205	M	
30	12.0	1,055	43.6	59.0	2,420	1.83	193	M	
Oct.... 2	11.2	1,048	43.1	59.0	2,417	1.78	186	M	
3	11.0	1,037	42.4	58.0	2,417	1.83	190	M	
4	11.1	1,047	43.3	58.0	2,415	1.55	162	R	
5	11.2	1,042	42.9	58.5	2,416	1.50	156	R	
6	11.3	1,043	43.1	58.0	2,419	1.88	196	M	
7	11.1	1,051	41.8	59.0	2,418	1.90	200	M	
9	10.9	1,036	42.8	59.0	2,418	1.80	187	M	
10	10.9	1,040	43.0	59.0	2,418	1.81	188	M	
11	10.9	1,026	42.4	59.0	2,418	1.87	192	M	
12	10.9	1,030	42.6	59.0	2,418	1.96	202	M	
13	10.7	1,029	42.5	59.0	2,417	1.87	192	M	
14	10.5	1,005	41.5	57.0	2,416	1.87	187	M	
16	10.0	986	40.9	57.5	2,411	1.82	179	M	
17	9.9	1,000	41.5	58.0	2,407	1.85	185	M	
19	9.7	974	40.5	57.0	2,406	1.84	179	M	
20	9.6	996	41.4	57.0	2,406	1.77	176	M	
21	9.6	1,001	41.6	57.0	2,406	1.80	180	M	
23	10.2	1,016	42.0	58.0	2,421	1.88	190	M	
24	10.3	1,017	41.9	58.0	2,423	1.93	196	M	

Mississippi River.—Columbus, Ky.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Oct....26	10.3	1,011	41.7	58.0	2,424	1.86	188	M	M = meter.
27	10.3	1,036	42.7	58.0	2,425	1.85	191	M	F = double floats.
28	10 4	1,008	41.6	58.0	2,425	1.93	195	M	R = rod floats.
30	10.6	1,034	42.6	58.0	2,426	1.96	202	M	
31	10.6	998	41.2	59.0	2,424	1.92	192	M	*Meter velocities observed at middepth and not corrected.
Nov 1	10.7	1,013	41.8	58.5	2,424	1.90	192	M	
2	10.9	1,046	43.1	58.0	2,425	1.88	197	M	
3	11.0	1,034	42.6	59.0	2,426	2.01	207	M	
5	11.1	972	40.1	57.0	2,426	1.92	187	*M	
6	11.1	1,023	42.2	59.0	2,426	1.99	204	M	
7	11.0	1,042	43.0	59.0	2,426	1.96	204	M	
8	11.1	1,025	42.3	58.0	2,426	1.97	202	M	
9	11.4	1,040	42.9	59.0	2,426	1.96	203	M	
10	11.9	1,044	43.0	60.0	2,429	1.93	201	M	
11	12.1	1,043	42.9	59.5	2,431	2.12	221	M	
13	12.7	1,058	43.5	60.0	2,435	2.14	226	*M	
14	13 0	1,064	43.7	60.0	2,438	2.29	243	M	
15	12.8	1,057	43.4	61.0	2,438	2.26	238	M	
17	13.1	1,081	44.3	60.0	2,440	2.27	245	M	
18	13.2	1,072	43.9	61.5	2,440	2.28	244	M	
20	12.9	1,063	43.6	61.0	2,438	2.26	240	M	
21	12.6	1,077	43.9	60.0	2,455	1.76	190	R	
22	12.4	1,042	42.5	59.6	2,455	1.81	188	R	
23	12.3	1,076	43.9	59.9	2,452	1.87	201	R	
24	12.2	1,052	43.1	59.8	2,442	1.88	198	R	
25	12.1	1,054	43.3	59.5	2,432	1.80	190	R	
1891.									
Feb....27	40.5	1,856	59.7	80.5	3,111	7.05	1,309	M	
28	40.8	1,890	60.7	78.5	3,113	7.22	1,364	M	
March. 1	41.0	1,865	59.6	80.0	3,128	7.40	1,381	M	
2	41.1	1,853	59.2	81.5	3,129	7.39	1,370	M	
3	41.2	1,874	59.8	83.0	3,132	7.35	1,378	M	
4	41.3	1,868	59.7	80.0	3,132	7.38	1,378	M	
11	40.6	1,850	59.3	81 0	3,121	6.43	1,189	F	
12	40.4	1,891	60.6	83.0	3,118	6.48	1,225	F	
13	40.4	1,878	60.2	83.0	3,117	6.62	1,243	F	
14	40.3	1,863	59.8	82.5	3,116	6.55	1,220	F	
15	40.2	1,854	59.5	82.5	3,116	6.41	1,189	F	
16	40.2	1,855	60.5	82.5	3,116	6.59	1,242	F	
17	40.2	1,877	60.2	82.5	3,116	6.81	1,185	F	
18	40.2	1,882	60.4	82.0	3.116	6.38	1,201	F	
20	40.2	1,895	60.8	82.0	3,116	6.46	1,224	F	
22	40.0	1,810	58.1	....	3,116	6.27	1,135	F	
23	40.0	1,838	59.0	79.5	3,116	6.43	1,182	F	
24	39.8	1,845	59.2	80.0	3,116	6.26	1,156	F	
25	39.6	1,849	59.3	80.0	3,116	6.32	1,168	F	
1892.									
April..13	41.3	2,026	64.9	86.0	3,122	6.42	1,300	M	
15	41.2	1,903	60.9	79.8	3,123	6.32	1,203	M	
16	41.0	1,893	60.7	79.8	3,121	6.14	1,163	M	
26	43.0	2,036	64 3	86.0	3,169	6.70	1,364	M	
27	43.0	2,058	64.9	84.5	3,169	6 72	1,384	M	
28	43.1	2,063	65.1	84.0	3,169	6.78	1,398	M	
29	43.1	2,051	64.7	85.0	3,169	6.59	1,352	M	
30	42.9	2,057	64.9	85.0	3,169	6.81	1,401	M	
1893.									
Feb....20	36.3	1,758	57.1	90.0	3,079	....	.....	F	
22	38.5	1,769	57.3	84.0	3,086	7.00	1,239	F	
23	39.1	1,823	59.0	90.0	3,090	7.04	1,283	F	
24	39.7	1,889	61 4	85.0	3,094	7 01	1,331	F	
25	40.1	1,935	62.4	84.0	3,103	6.91	1,337	F	
27	40.5	1,955	62.8	84.0	3,111	6.97	1,362	F	
28	40.7	1,945	62.3	81.6	3,123	6.93	1,348	F	
March 1	40.7	1,938	62.1	81.0	3,123	6.81	1,320	F	
2	40 4	1,940	62.4	81.0	3,109	6.61	1,281	F	
6	33.6	1,677	54 6	71.0	3,071	5.10	856	F	

MISSISSIPPI RIVER.—COLUMBUS, KY.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1893.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
May....5	43.1	2,032	64.7	87.0	3,141	7.11	1,445	F	M = meter.
6	43.5	†2,033	64.7	....	3,141	7.80	1,484	F	F = double floats.
7	43.6	2,075	66.1	86 0	3,141	7.26	1,507	F	R = rod floats.
8	43.8	2,081	66.3	90 0	3,141	7.20	1,499	F	
9	43.8	2,067	65.8	90.0	3,141	7.39	1,528	F	†Only about one-half the section sounded; balance interpolated from the 5th and 7th.
10	43.8	2,047	65.2	91.0	3 141	7.00	1,434	F	
11	43.8	2,045	65.1	93.0	3,141	7.19	1,470	F	
12	43.8	2,057	65.5	91.0	3,141	7.41	1,525	F	
13	43.8	2,066	65.8	90.0	3,141	7.37	1,523	F	
15	43.7	2,071	65.9	92.0	3,141	7.11	1,472	F	
16	43.4	2,071	65.9	90.0	3,141	6.90	1,430	F	
17	43.0	2,016	64.6	89.0	3,119	6.96	1,403	F	
18	42.2	2,020	64.8	87.0	3,116	6.58	1,329	F	
19	41.6	1,992	63.9	92.0	3,116	6.67	1,329	F	
20	40.6	1,935	62.2	90.0	3,111	5 91	1,144	F	

Mississippi River.—New Madrid, Mo.

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1888.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Dec.....1	15.2	1,256	21.3	30.0	5,905	3.46	435	M	M = meter.
3	12.8	1 123	19.1	29.6	5,880	3.38	380	M	F = double floats.
4	12.0	1,030	17.5	29.0	5,873	3.25	335	M	R = rod floats.
5	11 3	1,002	17.1	28.0	5,870	3.22	323	M	
6	10.4	974	16.6	26.0	5,865	3.14	306	M	The series of 1888-9 are printed in Report C. of E., 1890, p. 3150.
7	9.7	945	16.4	25.5	5,772	3.23	306	M	
8	9.2	898	15.8	25.0	5,687	3.16	284	M	
10	8.6	842	16.6	23.0	5,301	3.08	247	M	Observations were made on 2 sections 1½ miles apart, the upper one, called the low water section, was used from Dec. 13 to Jan. 18, and from Feb. 14 to 21, inclusive. The high water section was 8½ miles below New Madrid. The gauge readings tabulated are as observed on the M. R. C. N. Madrid gauge at Morrissons Ldg. The zero of this gauge is 275.80′ above the Cairo datum plane.
11	8.3	801	16.0	22.5	5,275	3.08	235	M	
12	8.0	759	15.2	22.5	5,267	3.13	228	M	
13	7.7	739	19.1	26.0	3,868	2.95	218	M	
14	7.4	732	19.2	25.0	3,866	2.98	218	M	
15	7.2	731	19 0	25.0	3,866	3.03	221	M	
17	6.9	728	18 8	25.5	3,863	2.95	215	M	
18	6.9	753	19.5	26.5	3,862	2.89	217	M	
19	7.0	742	19.2	26.0	3,864	2.95	219	M	
20	7.2	758	19 6	25.5	3,864	2.98	225	M	
21	7.5	759	19.7	26.0	3,865	3.02	229	M	
22	8 2	785	20.3	26.7	3,878	3.04	239	M	
24	8.9	820	21.1	27.5	3,890	3.18	260	M	
25	9.1	851	21.8	27.5	3,895	3.20	272	M	
27	9.6	853	21.8	28.0	3,908	3.23	275	M	
28	10.2	877	22.4	28.3	3,913	3.29	288	M	
29	10.8	890	22.9	30.0	3,917	3.36	302	M	
31	12.1	953	24.2	31.0	3,935	3.44	326	M	
1889.									
Jan....1	12.2	974	24.7	32.1	3,938	3 45	336	M	
2	12.1	972	24.7	32.0	3,936	3.42	332	M	
3	11.9	967	24.6	31.5	3,934	3.36	324	M	
4	11.4	953	23.8	30.5	3,926	3.32	309	M	
5	11.0	920	23.4	29.5	3,924	3.30	304	M	
7	11.2	919	23.5	29.5	3,922	3.34	307	M	
8	11.6	936	23.9	30.0	3,926	3.38	316	M	
10	13.4	998	25.3	32.0	3,949	3.56	355	M	
11	15.0	1,050	26.5	32.5	3,965	3.65	383	M	
12	17.0	1,113	28.0	34.0	3,979	3.99	444	M	
14	19.8	1,244	30.7	38.0	4,007	4.50	559	M	
15	20.3	1,289	32.1	38.7	4,010	4.48	576	M	
17	21.0	1,302	32.4	40.0	4,015	4.58	595	M	
18	21.3	1,332	33.1	40.0	4,023	4.54	605	M	
19	22.2	1,700	28.5	37.0	5,951	3.81	646	M	
21	24.1	1,771	29.7	37.5	5,955	3.91	692	M	
22	24.5	1,788	30.0	38.0	5,959	3.94	702	M	
23	24.2	1,759	29.5	37.0	5,955	3.93	693	M	
24	23.4	1,738	29.2	38.0	5,952	3.85	670	M	
25	22.2	1,688	28.4	37.4	5,942	3.82	645	M	
26	20.9	1,591	27.0	35.0	5,936	3.72	591	M	
28	18.8	1,470	24.8	33.0	5,923	3.62	533	M	
29	18.6	1,453	24.5	32.3	5,923	3.56	519	M	
30	19.1	1,459	24.6	33.5	5,925	3.62	529	M	
31	19.9	1,503	25.3	33.5	5,930	3.70	555	M	
Feb....1	20.6	1,560	26.3	35.0	5,935	3.68	574	M	
2	21.4	1,610	27.1	34.5	5,940	3.71	598	M	
4	22.4	1,667	28.0	34.8	5,946	3.83	639	M	
5	22.5	1,667	28.0	35.3	5,951	3.84	640	M	
6	22.0	1,648	27.7	35.0	5,950	3.83	632	M	
7	21.1	1,583	26.7	34.3	5,936	3 87	613	M	
8	19.9	1,489	25.1	32.5	5,926	3.59	535	M	
9	18.8	1,434	25.9	32.0	5,917	3.55	509	M	
11	16.5	1,255	21.3	29.5	5,902	3.46	435	M	
12	15.5	1,149	19.5	29.0	5,894	3.39	388	M	
13	13.9	1,100	18.7	28.0	5,887	3.39	373	M	
16	10.5	848	21.6	28.0	3,925	3.49	295	M	
18	10.0	844	21.5	27.7	3,914	3.48	294	M	
19	11.6	888	22.7	29.0	3,926	3.54	314	M	
20	14.8	1,042	26.3	32.7	3,965	3.98	415	M	

MISSISSIPPI RIVER.—NEW MADRID, MO.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1889.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Feb...21	18.3	1,182	29.6	36.0	3,998	4.39	519	M	M = meter.
22	20.8	1,535	25.9	34.0	5,930	3.82	586	M	F = double floats.
24	23.8	1,706	29.0	36.0	5,976	4.00	682	M	R = rod floats.
25	25.1	1,788	30.0	38.0	5,965	4.03	721	M	
26	25.6	1,859	31.2	39.0	5,966	4.06	754	M	
27	25.6	1,876	31.5	39.0	5,967	4.08	761	M	
28	25.4	1,875	31.4	39.5	5,967	4.00	750	M	
Mch... 1	25.0	1,837	30.8	38.8	5,962	4.01	736	M	
2	24.4	1,790	30.0	38.0	5,958	3.94	705	M	
4	22.9	1,680	28.3	38.0	5,948	3.86	648	M	
5	22.7	1,672	28.1	37.0	5,947	3.83	640	M	
6	22.7	1,668	28.0	37.5	5,947	3.84	640	M	
7	22.6	1,674	28.2	36.7	5,947	3.82	639	M	
8	22.4	1,660	27.9	38.0	5,944	3.77	625	M	
9	21.7	1,634	27.5	37.5	5,934	3.75	613	M	
11	20.2	1,550	26.2	35.7	5,927	3.65	566	M	
12	19.6	1,495	25.2	35.3	5,928	3.64	544	M	
13	19.1	1,458	24.7	34.7	5,918	3.63	529	M	
14	18.8	1,436	24.3	34.0	5,915	3.61	519	M	
15	18.4	1,416	24.0	33.7	5,914	3.56	504	M	
16	18.0	1,390	23.6	32.7	5,912	3.55	493	M	
18	17.2	1,316	22.3	32.0	5,905	3.53	464	M	
19	16.7	1,299	22.0	31.8	5,904	3.60	468	M	
20	16.5	1,274	21.6	31.0	5,902	3.43	437	M	
21	16.2	1,254	21.3	31.5	5,900	3.40	426	M	
22	16.2	1,251	21.2	30.5	5,898	3.39	424	M	
23	16.8	1,288	21.7	31.0	5,902	3.46	443	M	
25	19.0	1,413	23.9	33.0	5,919	3.60	508	M	
26	19.4	1,443	24.4	33.7	5,925	3.69	532	M	
28	19.0	1,435	24.2	33.3	5,925	3.67	527	M	The 1890 discharges are printed in the Report C. of E., 1890, p. 3157. The discharges of 1893 will appear in Report C. of E. for 1894.
29	18.6	1,411	23.8	33.5	5,920	3.67	518	M	
30	18.0	1,378	23.3	32.0	5,912	3.62	498	M	
April... 1	17.3	1,313	22.2	31.5	5,909	3.57	469	M	
2	16.8	1,285	21.7	31.0	5,901	3.44	442	M	
3	16.3	1,261	21.4	30.3	5,896	3.46	437	M	
4	16.1	1,232	20.9	30.3	5,896	3.42	421	M	The sec'n of 1890 was at same place as the high water section of 1888-9 and about 3¾ miles below New Madrid, Mo. The section of 1893 was also at same place, except that the Kentucky end of section was moved upstr'm about 200 feet. The gauge readings for 1890 are as observed on the M. R. C. gauge at Morrisson Ldg., whose zero is 275.80 ft. above the Cairo datum plane. The readings tabulated for 1893 are as observed on the M. R. C. gauge at New Madrid, at mouth of St. John's Bayou; this gauge, which was established in Nov. 1892, is about 1.3 miles below the gauge at Morrissons, and its zero is 275.72 feet above the Cairo datum plane. Morrison L'g gauge was discontinued October 11, 1893
5	16.1	1,231	21.4	30.3	5,896	3.42	422	M	
6	16.2	1,232	20.9	30.3	5,896	3.44	424	M	
8	16.2	1,239	21.0	30.5	5,897	3.44	426	M	
9	15.9	1,229	20.9	30.5	5,894	3.42	420	M	
10	15.5	1,204	20.4	30.3	5,892	3.38	407	M	
11	15.1	1,187	20.2	29.7	5,890	3.38	402	M	
12	14.8	1,167	19.8	29.7	5,889	3.35	391	M	
13	14.6	1,152	19.6	29.7	5,887	3.30	380	M	
15	14.1	1,121	19.1	29.0	5,883	3.30	370	M	
16	13.8	1,097	18.7	28.0	5,880	3.29	362	M	
17	13.6	1,078	18.4	27.3	5,880	3.28	353	M	
18	14.2	1,088	18.5	28.0	5,883	3.33	362	M	
19	14.9	1,132	19.2	28.8	5,892	3.36	381	M	
20	15.6	1,171	19.9	29.7	5,899	3.42	402	M	
22	16.6	1,217	20.6	31.0	5,905	3.50	426	M	
23	17.0	1,250	21.2	31.0	5,908	3.51	439	M	
24	17.6	1,284	21.8	32.0	5,912	3.59	461	M	
25	18.3	1,327	22.4	33.2	5,919	3.65	485	M	
26	18.6	1,366	23.1	34.0	5,924	3.67	502	M	
27	18.4	1,351	22.8	33.5	5,921	3.64	492	M	
29	16.0	1,227	20.8	31.5	5,899	3.45	423	M	
30	14.8	1,154	19.6	29.0	5,890	3.36	388	M	
May.... 1	13.7	1,088	18.5	27.8	5,880	3.29	358	M	
2	12.7	1,024	17.4	26.3	5,876	3.26	334	M	
1890.									
March 25	36.6	2,397	39.5	51.8	6,066	5.55	1,329	M	
April 8	37.7	2,465	40.3	52.0	6,114	.....	.....	M	
10	36.9	2,409	39.5	53.0	6,106	5.29	1,274	M	
11	36.2	2,360	38.7	52.5	6,091	5.23	1,235	M	
12	35.6	2,351	38.3	53.0	6,085	5.21	1,214	M	
14	34.2	2,262	37.3	52.0	6,058	4.75	1,074	M	

Mississippi River.—New Madrid, Mo.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1893.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Feb....20	31.0	2,146	34.5	53.0	6,215	5.45	1,171	M	M = meter.
21	31.8	2,220	35.7	54 0	6,216	5.05	1,122	M	F = double floats.
22	32.7	2,240	36.0	54.0	6,218	5.29	1,184	M	R = rod floats.
23	33.1	2,263	36.3	54 5	6,236	5.19	1,174	M	
24	33.6	2,317	37.1	55.0	6,241	5.38	1,246	M	
24	.....	.....	.....	.....	.....	5.06	1,172	F	
25	34.0	2,391	38.3	55.0	6,246	5.23	1,251	M	
25	.....	.....	.....	.....	.....	5.23	1,250	F	
27	34.6	2 335	37.4	57.0	6,248	5.46	1,275	M	
28	34 7	2,393	38.3	56.8	6,248	5.40	1,293	M	
24	.....	.....	.....	.....	.....	5.11	1,222	F	
March 1	31.9	2,425	38.8	58.0	6,251	6.54	*1,585	M	* Observer considers velocities too high, and says to reject this discharge.
1	.....	.....	.....	.....	.....	5.26	1,276	F	
2	34 9	2.429	38.8	55.0	6,254	5 28	1,283	M	
2	.....	.....	.....	.....	.....	4.86	1,180	F	
3	34.7	‡2,425	38.8	.....	6,254	5 13	1,244	M	
5	33 0	2 335	37.4	53.5	6,248	5.24	1,223	M	
6	30.9	2,190	35 1	52.0	6,239	4.88	1,070	M	
7	28.5	2,028	32.6	49.0	6,228	4.79	971	M	
7	.....	.....	.....	.....	.....	4.48	906	F	‡ Area interpolated from 2nd and 5th.
May.... 4	36.0	2,475	39.3	49.5	6,296	5.14	1,273	M	
4	.....	.....	.....	.....	.....	5.11	1,264	F	
5	36 5	2,539	40.3	52 0	6,299	5.41	1,374	M	
6	37.0	2,528	40.1	50.0	6,302	5.69	1,438	M	
8	37.9	2,685	42.6	54.0	6,305	5.72	1,537	M	
8	.....	.....	.....	.....	.....	5.41	1,454	F	
9	38.1	2,628	41.7	51.8	6,306	5.64	1,482	M	
9	.....	.....	.....	.....	.....	5.52	1,452	F	
10	38.1	2,644	41.9	52.0	6,307	5.53	1,462	M	
10	.....	.....	.....	.....	.....	5.49	1,452	F	
11	38 1	2,588	41.0	54.4	6,306	5.89	1,525	M	
12	38.0	2,600	41.2	54.8	6,306	5.39	1,400	M	
12	.....	.....	.....	.....	.....	5 62	1,461	F	
13	38.0	2,636	41 8	54.4	6,307	5.66	1,493	M	
13	.....	.....	.....	.....	.....	5.57	1,468	F	
15	37.9	2,601	41.2	54.4	6,308	5.84	1,518	M	
15	.....	.....	.....	.....	.....	5.61	1,459	F	
16	37.8	2,570	40.7	54.5	6,308	5.75	1,478	M	
17	37.5	2,524	40.0	53.6	6,307	5.72	1,444	M	
17	.....	.....	.....	.....	.....	5.45	1,375	F	
18	37.1	2,511	39.8	53 0	6,304	5 48	1,376	M	
19	36.5	2,467	39.1	54.0	6,304	5.41	1,336	M	
20	35.9	2,370	37.6	52.7	6,300	5.28	1,252	M	

Mississippi River.—Point Pleasant, Mo.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1884.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Oct....14	13.0	1,066	23.0	35.0	4,619	3.68	392	M	
15	13.3	1,016	22.0	35.0	4,625	3.49	354	M	M = meter.
20	13.0	969	21.0	36.0	4,623	.....	.....	M	
21	12.7	968	21.0	33.5	4,621	.....	.....	M	This series of discharges is printed in Report C. of E. 1887, p. 2815.
22	12.3	968	21.0	34.0	4,618	3.62	350	M	
23	12.0	954	20.7	33.5	4,617	3.69	352	M	
24	11.6	1,013	21.9	34.0	4,615	3.41	346	M	
25	11.4	1,010	21.9	34.0	4,614	3.41	344	M	
27	11.5	1,049	22.7	35.0	4,622	3.44	361	M	
29	11.9	936	20 2	34.8	4,623	3.70	346	M	The discharge section was located about 4 miles below Point Pleasant, Mo., and about 13 miles below New Madrid, Mo.
30	11.8	1,032	22.3	37.2	4,622	3.42	353	M	
31	11.6	919	19 9	32 2	4,622	3.63	334	M	
Nov.... 3	11.0	887	19 2	32 4	4,615	3.67	325	M	
5	10.1	838	18.2	32.9	4,608	3.51	295	M	The gauge whose readings are tabulated was called the section gauge, its zero was 267.23 feet above the Cairo datum plane. The readings on this gauge below the 8 foot stage do not differ more than 0.4 feet from the readings on the New Madrid gauge, but at higher stages the readings indicate large variation in slope between the two places.
10	8.3	752	16.4	30.6	4,596	3.33	250	M	
11	7.9	781	15.9	30.3	4,593	3.15	230	M	
14	7.0	691	15.1	28.4	4,588	3 38	234	M	
17	6.5	672	14.6	28.1	4 586	3.26	219	M	
18	6.5	669	14 6	28.5	4.586	3.19	214	M	
19	6.5	660	14.4	30.5	4,586	3.16	209	M	
24	5.8	626	13.7	28.0	4,583	3.18	199	M	
25	5.7	630	13.7	27.5	4,580	3.19	201	M	
26	5.7	632	13.8	27 5	4,580	3.16	199	M	
28	7.2	692	15.1	29.0	4,595	3.32	230	M	
29	7.6	710	15.4	29.5	4,598	3.30	235	M	
Dec.... 1	7.6	708	15.4	29.5	4,598	3.33	236	M	
2	7.5	708	15.4	29.5	4,609	3.25	230	M	
3	7.2	689	15.0	29.0	4,603	3.34	230	M	
4	6.7	666	14.5	29.0	4,598	3.27	218	M	
5	6.1	635	13.8	28.0	4,594	3.24	205	M	
8	4.6	561	12.3	26.5	4,575	3.10	174	M	
9	4.2	531	12.6	25.5	4,225	3.09	164	M	
10	3.9	526	12.6	25.0	4,184	3.14	166	M	
11	4.2	532	12.6	25.5	4,225	3.22	171	M	
12	5.0	573	12.5	26.5	4,580	3.22	185	M	
13	6.3	639	13.9	27.0	4,598	3.30	211	M	
15	8.0	719	15.6	29.0	4,613	3.29	237	M	
16	9.0	781	16.9	30.0	4,619	3.50	273	M	
31	17.4	1,142	24.5	39.0	4,661	4.40	503	M	
1885.									
Jan.... 1	20.0	1,266	27.1	40.0	4,675	4.84	613	M	
7	23.3	1,439	30.7	42.0	4,689	4.95	712	M	
8	25.6	1,460	31.1	43.0	4,689	4.87	711	M	
9	24.0	1,476	31.5	43.0	4,689	5.09	751	M	
10	25.0	1,583	32.7	44.0	4,691	5.00	767	M	
13	27.6	1,579	33.6	46.0	4,698	5.17	816	M	
14	27.8	1,621	34.5	46.5	4,698	5.19	842	M	
Feb.... 2	21.3	1,214	26.0	38.0	4,663	4.62	561	M	
3	20.0	1,152	24.7	38.0	4,665	4.42	509	M	
7	17.8	1,047	22.4	35.0	4,663	.....	.....	M	
9	18.5	1,068	22.9	36.0	4,672	4.54	485	M	
10	19.0	1,101	23.5	36.0	4,689	4 51	497	M	
11	19.3	1,147	24.4	36.0	4,689	4.45	510	M	
Mar.... 2	11.4	850	18.4	29.0	4,623	3.68	313	M	
3	11.8	860	18.6	27.0	4,625	3.71	319	M	
4	12.6	901	19.5	28.0	4,630	3.87	349	M	
7	15.3	1,041	22.4	30.0	4,653	4.06	423	M	
9	18.7	1,196	25.6	35.5	4,669	4.26	510	M	
10	20.6	1,277	27.3	35.5	4,677	4.22	539	M	
11	22.0	1,404	30.0	40.0	4,687	4.36	612	M	
13	22.8	1,465	31.2	42.0	4,692	4.46	653	M	
14	23.3	1,492	31.8	42.0	4,692	4.37	652	M	
19	26.6	1,663	35.4	46.0	4,699	4.88	812	M	
20	26.3	1,633	34.7	43.0	4,699	4.77	779	M	
21	26.1	1,661	35.4	43.0	4,699	4.79	795	M	

MISSISSIPPI RIVER.—POINT PLEASANT, MO.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1885.	feet.	100sq.ft	feet.	feet.	feet.	feet.	1000 cu.ft.		
March. 23	25.5	1,601	34.1	42.0	4,699	4.52	723	M	M = meter.
24	25.0	1,575	33.5	42.0	4,700	4.42	696	M	F = double floats.
25	21.6	1,579	29.5	38.0	4,683	4.38	603	M	R = rod floats.
30	19.1	1.262	27.0	36.0	4,680	4.06	512	M	
31	18.3	1,190	25.5	34.5	4,669	4.04	481	M	

Mississippi River.—Plum Point Reach.—Ashport Bend, 1894.

Nov... 8	1.8	380	35.9	66.0	1,059	2.17	83	F	F = double floats.
10	1.9	384	36.6	66.0	1,051	2.14	82	F	

The discharge section is located in Ashport Bend about 1,000 feet below Range 23 T, Survey of Plum Point Reach, and about 153 miles below Cairo.

Observations and reductions under direction of M. R. C. 1st district officer by Assistant B. B. Gordon.

The gauge readings given in table are those of M. R. C. gauge at Fulton, whose zero is 228.55 feet above the Cairo datum.

The Amelia gauge read — 2'.1 on the 8th and 10th.

There were 11 velocity stations and 24 soundings on the 8th, and 9 velocity stations and 16 soundings on the 10th.

Floats were run and timed between ranges 200 feet apart. The lower float was at about six-tenths depth.

Mississippi River.—Plum Point Reach.—Bullerton, Ark.

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1883.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Sept... 5	• 8.4	247	25.5	.....	.....	5.10	126	F	M = meter.
5	† 8.4	187	9.2	.....	.....	2.80	52	F	F = double floats.
5	‡ 8.4	104	7.7	.....	.....	2.50	26	F	R = rod floats.
Total...	.....	.....	.....	.....	.....	.....	204		• Bullerton Chute.
Oct. 26	• 8.4	242	23.5	36.0	1,029	4.38	106	F	† Middle channel.
" 26	† 8.4	188	8.7	22.0	2,165	3.60	68	F	‡ Tennessee Chute.
" 26	‡ 8.4	120	8.4	19.0	1,419	3.33	40	F	¿ Osceola Chute.
Total...	.....	551	11.9	36.0	4,613	3.89	214		Observations by M. R. C. 1st dist. officer. Those of Oct. 26 and part of Dec'r 8 reduced in Secretary's office. Part of tabulation in Report C. of E. 1884, p. 2791, and part in do. 1885, p. 2649.
Dec ... 8	•18.9	515	21.0	37.0	2,457	4.19	216	F	
" 8	†18.9	396	36.5	48.0	1,087	4.43	175	F	
" 8	‡18.9	.....	.....	.....	.....	.....	113	F	
" 8	¿18.9	84	12.7	23.5	663	1.19	10	F	
Total...	.....	.....	.....	.....	.....	.....	514		
1884.									
Sept....15	• 7.2	205	.....	.....	.....	1.65	34	M	Observations by M. R. C. 1st dist. officer. Tabulation, Report C. of E. 1885, p 2769
" 15	‡ 7.2	230	.....	.....	.....	1.67	38	M	
" 15	¶ 7.2	133	.....	.....	.....	3.35	45	M	
" 15	○ 7.2	136	.....	.....	.....	1.92	26	M	
Total..	.....	.....	.....	.....	.....	.....	143		
1890.									
March. 7	a 32.8	1,444	.....	67.0	2,900	5.28	762	M	‡ Channel outside of Bullerton.
" 7	b 32.8	440	.....	66.0	1,920	3.24	142	M	¶ Middle Bar Channel.
" 7	c 32.8	333	.....	28.0	1,345	3.39	113	M	○ Yankee Bar Channel.
Total...	.....	2,217	.....	.....	6,165	.....	1018		All the gauge readings are those of the Fulton standard gauge, whose zero is 228.55 feet above the Cairo datum plane.
" 9	a 33.6	1,487	.....	67.0	2,900	5.49	816	M	
" 9	b 33.6	423	....	62.0	1,920	3.59	152	M	
" 9	c 33.6	346	.....	29.0	1,345	3.16	109	M	
Total..	.....	2,256	.....	.....	6,165	.....	1077		
" 12	a 34.2	1,536	.....	68.0	2,900	5.54	850	M	a Main river.
" 12	b 34.2	453	.....	68.0	1,920	3.57	162	M	b Elmot Chute.
" 12	c 34.2	345	.....	30.0	1,345	3.39	117	M	c Island No. 30 Chute.
Total..	.....	2,334	.....	.....	6,165	.....	1129		
" 15	a 34.7	1,524	.....	64.0	2,900	5.76	878	M	M. R. C. 1st district officer. Tabulation, Report C. of E. 1890 p. 3218.
" 15	b 34.7	496	.....	67.0	1,920	3.52	175	M	
" 15	c 34.7	368	.....	31.0	1,345	3.19	117	M	
Total...	.....	2,389	.....	.....	6,165	.....	1170		
1891.									
Jan.... 6	a 20.1	1,022	37.4	47.0	2,732	5.48	555	M	Observations by M. R. C. 1st dist. officer. Reduction in Secretary's office. Tabulation, Report C. of E., 1892, p. 3128.
" 6	b 20.1	.....	.....	.....	.....	.....	.....		
" 6	c 20.1	110	11.6	15.0	947	3.41	38	M	
" 7	a 20.6	1,039	38.0	47.0	2,733	5.41	562	M	
" 7	b 20.6	190	13.6	35.0	1,398	1.89	36	M	
" 7	c 20.6	117	12.3	15.0	951	3.57	42	M	
Total.	.....	1,346	.....	.....	5,082	.....	640		
" 26	a 16.5	888	32.9	41.0	2,696	5.08	451	M	
" 27	b 15.9	150	17.0	33.0	880	1.41	21	M	
" 26	c 16.5	70	7.5	12.0	929	3.28	23	M	
Total...	.....	1,107	.....	.....	4,505	.....	495		
" 28	a 15.8	864	32.1	40.0	2,695	4.66	403	M	
" 28	b 15.8	147	16.7	32.5	880	1.16	17	M	
" 28	c 15.8	61	6.5	12.0	928	3.26	20	M	
Total...	.....	1,072	.....	.....	4,503	.....	439		
Sept....19	7.2	636	26.6	34.0	2,386	2.43	155	M	d Elmot Ldg. This is total discharge of river.
" 21	6.7	618	25.9	34.0	2,385	2.22	137	M	
" 22	6.5	624	26.2	32.0	3,385	2.41	150	M	
" 26	5.9	627	26.3	32.0	2,387	2.19	137	M	
Nov .. 5	d 2.9	517	21.8	29.0	2,376	1.58	82	M	
" 6	2.8	524	22.1	30.0	2,376	1.57	82	M	
" 10	2.8	532	22.4	28.5	2,377	1.55	82	M	
" 11	2.8	525	22.1	28.0	2,377	1.51	79	M	

Mississippi River.—Plum Point Reach.—Fulton, Tenn.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1879.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Nov....29	8.8	847	34.6	43.5	2,450	3.11	264	F	M = meter.
Dec.... 1	9.0	834	34.0	42.0	2,454	3.08	257	F	F = double floats.
3	9.8	821	33.3	42.5	2,469	3.31	272	F	R = rod floats.
4	10.0	867	35.2	43.0	2,465	3.37	293	F	
6	10.3	875	35.4	43.0	2,475	3.42	300	F	Observations and reductions by M. R. C. Secretary's office.
8	11.0	889	35.4	44.5	2,485	3.59	320	F	Tabulation, Rep't M.
10	13.3	949	37.9	47.0	2,501	4.15	393	F	R. C. 1881, p 98.
12	15.0	996	39.6	48.5	2,514	4.79	478	F	Report on observations, ibid. p. 74.
16	21.6	1,179	46.1	56.0	2,556	5.70	672	F	The gauge readings are those of the Fulton M. R. C. gauge, whose zero is 228.55' above the Cairo datum plane.
18	22.8	1,204	47.0	58.0	2,561	5.93	714	F	
19	23.0	1,210	47.2	57.5	2,563	5.96	721	F	
22	22.4	1,179	46.0	54.5	2,562	5.76	678	F	
26	20.7	1,141	44.7	54.0	2,554	5.33	609	F	
28	23.3	1,221	47.8	56.5	2,563	5.83	713	F	
31	27.3	1,288	49.1	61.5	2,583	6.43	828	F	
1880.									
Jan... 3	28.8	1,382	53.7	65.0	2,578	6.90	954	F	
8	27.7	1,332	51.7	68.0	2,576	6.34	844	F	
9	27.4	1,329	51.5	67.0	2,578	6.10	810	F	
10	27.9	1,319	51.1	64.0	2,582	6.51	859	F	
13	30.2	1,395	54.0	68.0	2,585	6.99	976	F	
15	31.2	1,416	54.6	67.0	2,592	7.37	1,044	F	
17	32.0	1,421	54.8	67.0	2,595	7.49	1,066	F	
19	32.2	1,451	55.9	67.0	2,595	7.23	1,049	F	
21	32.0	1,449	55.4	69.0	2,600	7.13	1,027	F	
23	31.1	1,389	53.6	68.0	2,592	7.14	992	F	
26	27.9	1,237	50.1	63.0	2,569	6.32	807	F	
28	25.4	1,254	48.9	60.0	2,563	5.95	746	F	
31	21.3	1,148	45.0	56.5	2,552	4.98	572	F	
Feb.... 3	18.2	1,063	41.9	53.0	2,536	4.59	489	F	
5	16.9	1,026	40.7	50.0	2,522	4.41	453	F	
7	15.5	966	38.4	50.0	2,514	4.11	397	F	
9	15.1	979	39.1	49.5	2,510	4.08	409	F	
12	14.1	937	37.4	48.0	2,506	3.95	370	F	
14	15.2	970	38.6	50.0	2,513	4.07	395	F	
16	21.6	1,143	44.8	56.5	2,552	5.50	629	F	
18	26.9	1,274	49.6	62.0	2,575	6.73	858	F	
20	29.1	1,340	51.9	64.0	2,581	7.09	951	F	
23	31.4	1,398	53.5	67.0	2,595	7.33	1,025	F	
25	32.3	1,390	53.1	65.0	2,599	7.50	1,035	F	
Mch... 1	32.9	1,363	52.4	69.0	2,599	7.60	1,037	F	
3	32.8	1,398	53.8	69.0	2,597	7.58	1,060	F	
5	32.7	1,412	54.3	69.0	2,600	7.39	1,044	F	
8	32.3	1,353	52.7	68.0	2,599	7.34	994	F	
10	32.1	1,389	53.5	69.0	2,598	7.47	1,038	F	
12	32.4	1,364	52.4	68.0	2,600	7.56	1,031	F	
16	33.2	1,375	52.9	69.0	2,600	7.57	1,041	F	
18	33.5	1,400	53.7	70.0	2,608	7.91	1,108	F	
20	33.8	1,422	54.5	70.0	2,610	7.50	1,068	F	
22	34.0	1,424	54.6	70.0	2,607	7.41	1,054	F	
24	34.1	1,443	55.2	70.0	2,612	7.75	1,117	F	
26	34.1	1,435	54.9	69.0	2,612	7.45	1,070	F	
29	34.0	1,405	53.7	68.0	2,615	7.74	1,088	F	
31	33.6	1,442	55.2	68.0	2,604	7.55	1,089	F	
April... 2	32.5	1,403	54.0	68.0	2,597	7.13	999	F	
3	32.9	1,384	53.4	66.0	2,595	6.87	951	F	
5	29.7	1,326	51.3	64.0	2,584	6.41	850	F	
7	28.0	1,285	50.0	61.0	2,574	6.46	830	F	
9	27.4	1,252	47.4	62.0	2,598	6.31	777	F	
11	27.1	1,255	48.2	61.0	2,602	6.42	806	F	
13	26.6	1,246	47.9	62.5	2,603	6.04	754	F	
15	26.2	1,244	47.8	61.0	2,601	6.17	767	F	
17	24.6	1,200	46.2	60.0	2,595	5.67	680	F	
19	24.2	1,189	45.1	58.5	2,592	5.56	661	F	
21	24.5	1,211	46.6	59.0	2,596	5.78	700	F	
23	25.2	1,214	46.7	60.5	2,603	5.93	722	F	

MISSISSIPPI RIVER.—FULTON, TENN.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1880.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
April 24	25.4	1,223	47.4	59.5	2,599	5.96	729	F	M = meter.
27	24.9	1,199	46.1	59.0	2,598	5.84	701	F	F = double floats.
29	23.9	1,199	46.2	60.0	2,596	5.56	667	F	R = rod floats.
May.... 1	24.9	1,212	46.7	59.0	2,599	6.08	737	F	
3	27.1	1,283	49.2	62.5	2,610	6.31	809	F	
4	27.8	1,297	49 7	61.5	2,608	6.56	851	F	
6	28.6	1,328	50.6	64.0	2,614	6.63	877	F	
8	29.0	1,335	51.0	64.0	2,618	6.70	895	F	
10	28.6	1,327	50 7	63.0	2,618	6.57	872	F	
11	28.0	1,314	50.2	62.5	2,616	6.26	823	F	
12	27.0	1,307	50.0	62 5	2,612	6.13	801	F	
13	25.7	1,281	49.2	63.0	2,606	5.89	755	F	
14	24.5	1,245	47.8	60.0	2,606	5.74	714	F	
15	23.2	1,193	45.9	57.0	2,600	5.31	633	F	
17	20.6	1,113	43.2	55.0	2,578	4.78	533	F	
18	19.4	1,101	42.6	55.0	2,586	4.53	499	F	
19	18.3	1,064	41 4	51 5	2,573	4.34	462	F	
20	17.3	1,026	40.0	52.5	2,566	4.10	421	F	
21	16.7	1,019	39.8	50.5	2,558	4.13	421	F	
22	16.1	999	39 1	50.0	2,556	3.90	389	F	
24	15.8	988	38.6	48.0	2,557	3.95	390	F	
25	15.7	991	38.8	49.0	2,557	3.88	385	F	
26	15 6	986	38.6	48.5	2,556	3 84	378	F	
27	15.3	982	38.4	48 5	2,555	3.76	369	F	
28	15.2	965	37.8	49.0	2,554	3.83	369	F	
29	14.8	963	37.7	48.5	2,553	3.65	351	F	
31	14.8	959	37.6	49.5	2,553	3.77	362	F	
June... 1	15.3	973	38.9	48.5	2,553	3.90	380	F	
2	16.0	990	38.6	50 5	2,565	4.03	399	F	
3	16.8	1,015	39.6	50.0	2,566	4.33	439	F	
4	17.4	1,028	40.0	51.5	2,571	4.39	451	F	
5	18.0	1,062	41.2	54.0	2,579	4.35	462	F	
7	18.4	1,074	41.6	52 5	2,584	4.52	485	F	
8	18.4	1,084	42.0	52.5	2,584	4.66	504	F	
9	18.6	1,075	41.6	54.0	2,584	4.58	492	F	
10	18.5	1,073	41 1	53.0	2,584	4.53	487	F	
11	18.3	1,061	41.1	52 5	2,582	4 49	476	F	
12	17.8	1,039	40.3	51.0	2,575	4.37	455	F	
14	17.4	1,043	40.5	51.5	2,575	4.34	452	F	
15	17.4	1,033	40.1	52.0	2,575	4.36	450	F	
16	17.1	1,024	39.8	51 5	2,572	4.22	432	F	
17	16.7	1,036	40 0	50 5	2,567	4.22	437	F	
18	16.0	1,008	39 3	49.5	2,563	4.04	407	F	
19	15.8	981	38.3	49 0	2,561	4.04	397	F	
21	15.5	982	38.3	50 0	2,561	4.08	401	F	
22	16.3	1,022	37.8	50.0	2,568	4.19	428	F	
23	16.6	1,029	40.1	51.0	2,569	4.22	435	F	
24	17.2	1,044	40.5	50.5	2,578	4.35	454	F	
25	18.2	1,064	41.2	51.5	2,584	4.47	475	F	
26	18.7	1,069	41.3	52.0	2,589	4.74	507	F	
28	19.7	1,111	42 8	54.0	2,593	4.86	540	F	
29	20.2	1,117	43.4	55.0	2,594	4.98	550	F	
July... 1	20.5	1,119	43.2	53.0	2,594	4.96	555	F	
2	20.3	1,112	42.9	54.0	2,592	4.86	541	F	
3	20.2	1,104	42.6	52 5	2,593	5.02	555	F	
5	21.3	1,137	43.7	53.0	2,600	5.19	590	F	
6	23 0	1,180	45 3	56.0	2,604	5.76	679	F	
7	24.0	1,236	47.4	56.5	2,606	5.88	726	F	
8	24.9	1,238	47.4	56.5	2,611	6.04	748	F	
9	25.9	1,273	48.7	60.5	2,613	6.33	805	F	
10	26.0	1,328	50 7	60.5	2,617	6.23	828	F	
12	26.1	1,261	48.2	59 5	2,617	6 29	793	F	
13	25.7	1,217	46.5	56.5	2,616	6.17	752	F	
14	25.2	1,201	45.9	56.0	2,611	5 96	715	F	
15	24.7	1,188	45.4	57.0	2,615	5.98	711	F	

Mississippi River.—Fulton, Tenn.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1880.	feet.	100sq.ft	feet.	feet.	feet.	feet.	1000 cu.ft.		
July...16	23.9	1,180	45.3	56 0	2,607	5.64	666	F	M = meter.
17	23.3	1,156	44.4	56.0	2,602	5.51	637	F	F = double floats.
19	21.8	1,136	43.8	54.0	2,597	5.18	589	F	R = rod floats.
20	21.0	1,113	42.9	53.5	2,593	5.08	565	F	For notes see p. 45.
21	20.1	1,085	41.8	52.0	2,594	4.90	532	F	
22	19.4	1,057	40.8	52.5	2,589	4.78	505	F	
23	18.6	1,037	40.1	50.0	2,585	4.62	479	F	
24	17.8	1,022	39.4	50.0	2,572	4.51	461	F	
26	16.5	992	38 8	49.0	2,556	4.09	406	F	
27	16.0	968	37.8	47.0	2,557	4.07	394	F	
28	15.5	961	37.6	48.0	2,553	3.89	373	F	
29	15.1	965	37.8	47.0	2,549	3.96	382	F	
30	14.6	985	38.7	48.0	2,546	3 79	373	F	
31	14.2	950	37.4	46.5	2,542	3.59	341	F	
Aug... 2	12.9	920	36.3	45.0	2,534	3.37	310	F	
3	12.5	902	35.6	45.0	2,533	3.38	305	F	
4	11.9	894	34.9	44.0	2,529	3.32	297	F	
5	11.6	868	34 4	43.5	2,524	3.14	278	F	
6	11.2	849	33.6	43.5	2,521	3.05	259	F	
7	10.8	849	33.7	44.0	2,519	3.03	257	F	
9	10.2	840	33.5	43.5	2,508	2.90	243	F	
10	9.9	826	32.9	42.0	2,505	2.82	233	F	
11	9 8	820	32.8	43.0	2,504	2.72	224	F	
12	9.6	823	32.9	42.0	2,501	2.82	232	F	
13	9.5	816	32.7	41.0	2,500	2.78	227	F	
14	9.4	818	32.7	42.5	2,499	2.76	226	F	
16	9.2	816	32.7	41.0	2,498	2.68	219	F	
17	9.2	807	32 3	41.5	2,498	2.71	219	F	
18	9.0	805	32 3	41 0	2,495	2.66	214	F	
19	8.8	798	32 0	41.0	2,493	2.53	202	F	
20	8 6	797	32.0	40.5	2,491	2.50	199	F	
21	8.4	783	31.1	41 0	2,484	2.52	198	F	
23	7.9	763	30.9	39.0	2,477	2.45	187	F	
24	7.7	763	30.9	38.5	2,473	2.36	180	F	
25	7.8	757	30.7	40.0	2,468	2.35	178	F	
26	7.0	742	30.1	40.0	2,464	2.26	168	F	
27	6 7	729	29.6	39.5	2,465	2 20	161	F	
28	6 7	729	29 5	39.0	2,465	2.22	161	F	
30	7.4	755	30.6	39.0	2,472	2.37	179	F	
31	7.7	763	30.8	39 0	2,478	2.49	190	F	
Sept... 1	8.0	784	31.6	41.0	2,484	2.59	203	F	
2	8 4	787	31.6	41.0	2,488	2.58	203	F	
3	8.8	778	31.1	41.0	2,500	2.68	209	F	
4	9.0	796	31.8	40.5	2,501	2.76	220	F	
6	9.1	804	32 1	42.5	2,502	2.83	228	F	
7	9.5	808	32.3	42.0	2,504	2.98	241	F	
8	9.9	844	33.6	43.0	2,509	3.13	264	F	
9	10.1	838	33 4	43 5	2,508	3.02	252	F	
10	10.1	831	33.1	43.0	2,508	3.01	250	F	
11	10.2	844	33.6	43.0	2,508	3 03	256	F	
13	10.7	858	34.1	43.0	2,520	3 20	275	F	
14	10.9	858	34 0	43.0	2,520	3.15	270	F	
15	10.5	846	33.6	43.0	2,516	3.09	261	F	
16	10.2	837	33 3	43.0	2,510	3 02	253	F	
17	9.6	810	32.4	42.0	2,502	2.87	233	F	
18	9.0	806	32 3	41.5	2,495	2.70	218	F	
20	8.1	779	31.4	41.5	2,481	2 55	199	F	Obs' ns 1884-5by M. R.
21	7.8	764	30.9	40 5	2,474	2.52	193	F	C. 1st Dist. officer.
22	7.5	773	31 3	41.0	2,473	2.51	194	F	Report and tabulation, Report C. of
23	7.4	765	31.0	40.0	2,469	2.46	188	F	E. 1885, p 2769. Results of final reduction of observations to May 9 in Secretary's office, Report C. of E. 1889, p. 2648.
24	7.2	751	30.4	40.0	2,467	2.35	171	F	
26	6.7	739	30.0	39.5	2,462	2 25	167	F	
27	6 5	735	29.9	39.5	2,462	2.34	172	F	
28	6.4	726	29.6	39.5	2,459	2.16	157	F	
29	6 3	731	29 7	39.0	2,455	2.25	164	F	

MISSISSIPPI RIVER.—FULTON, TENN.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1880.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Oct.... 1	6.2	724	29.4	38.5	2,455	2 13	154	F	M = meter.
2	6.2	728	29.6	39.5	2 455	2.14	156	F	F = double floats.
4	6.2	739	30.1	39.0	2,458	2.38	176	F	
5	6.6	737	29.9	39.5	2,461	2.30	170	F	¶ Head of Island 34.
7	7.0	748	30 4	40.0	2,463	2.37	177	F	This section was
8	7.1	746	30.3	40.0	2,4 3	2.43	181	F	wide and shallow—
1884.									the opposite of the
Feb....25	35.7	*1,641	59.9	71.2	‡ 2,737	8.60	1,411	F	other. They were so
26	35.7	1,686	61.6	74.6	2,737	8 44	1,424	F	situated that gaug-
Mar....12	31.4	1,668	62.4	77.8	2,674	6.28	1,047	F	ing them was equiv-
19	31.8	1,627	60.8	74.8	2,674	7 84	1,2 5	F	alent to gauging be-
April.. 3	35.0	1,778	64.7	80.0	2 749	8.55	1,520	F	hind a submerged
									dam and then on its
25	30.6	† 1,625	60.8	73.1	2,673	7.46	1,213	F	crest. The deep sec-
26	30.0	1,623	60.7	73.0	2,673	7.30	1,185	F	tion was the same as
May... 8	28.0	1,545	57.8	71.7	2,673	7.28	1,117	F	used in 1879-80.
9	28.4	‡ 1,554	58.2	72 1	2,673	7.22	1,122	F	‡ These widths are not
9	¶ 28.4	2,091	.....	.....	.....	4.45	931	F	precise, as the wa-
									ter's edge was not
24	‖ 21.2?	1,313	.....	.....	.....	4 50	591	F	exactly located.
June.. 21	20.4	1,315	.....	.....	.....	4.49	590	F	* If soundings taken
Aug... 6	14.2	1,122	.....	.....	.....	3 44	386	F	the following day
Sept...16	6.9	927	.....	.....	.....	2.00	181	F	are interpolated,
Oct.... 7	14.6	1,141	.....	.....	2,530	3.50	400		this area will be in-
									creased nearly 2 00'.
Nov... 12	8.7	876	.....	.....	2,470	2.36	207		† Soundings were ta-
18	7.6	956	.....	.....	2,470	2 10	203		ken April 26, and
19	7.5	942	.....	.....	2,460	2.05	193		corrected for change
21	7 4	922	.....	.....	2,420	2.14	196		of gauge.
22	7.3	929	.....	.....	2,450	2 11	196		‡ Soundings were ta-
									ken May 8, and cor-
26	6.9	865	.....	.....	2,455	1.99	172		rected for change of
28	7.3	924	.....	.....	2,435	2.14	202		gauge.
Dec.... 8	6.3	877	.....	.....	2,428	1.94	170		‖ Gauge reading as
9	5.8	880	.....	.....	2,420	1.96	173		corrected by Mr.
12	5.5	872	.....	.....	2,420	1.79	156		Seddon from plot.
1885.									Observations and re-
Jan.... 9	22.2	1,311	.....	.....	2,580	5 10	669		duction by M. R. C.
19	27.0	1,439	.....	.....	2,620	6.48	933		1st district officer.
Mar...21	23.9	1,333	.....	.....	2,626	5.67	756	F	Tabulation from Oc-
April.. 4	15.8	1,101	.....	.....	2,570	4.27	470	F	tober 7, 1884, to Feb.
16	23.5	1,313	.....	.....	2,622	5.61	737	F	25, 1887, not hereto-
1887.									fore published.
Feb ...25	33.9	.....	.....	.....	.....	.....	1,122		Widths from Oct. 7,
1891.									1884 to Jan. 19, 1885,
April.. 1	32.2	1,552	60.0	82.7	2,585	7.01	1,088	M	scaled from field
1892.									plots.
April..15	33.0	1,581	61.5	92.0	2,570	7.54	1,192	F	Tabulation for 1891 in
16	33.1	1,578	61.4	92.7	2,570	7.29	1,151	F	Report C. of E. 1892,
18	33.2	1,748	68.0	99.1	2,570	7.37	1,289	F	p 3129.
19	33.3	1,740	67.7	93.7	2,570	7.95	1,382	F	Section of 1892 is about
21	33.4	1,622	63.1	92.5	2,570	7.69	1,248	F	5,000 feet above the
									landing at Fulton,
22	33.4	1,467	57.1	82.1	2,570	7.47	1,095	F	and 1,600 feet above
23	33.3	1,561	60.7	86.0	2,570	7.80	1,218	F	that used in 1879-80.
25	33.5	1,364	53.1	73.7	2,570	8 06	1,099	F	Tabulation in Report
26	33.7	1,546	60.2	84.5	2,570	7.98	1,234	F	C of E. 1893, p. 3683.
27	33.8	1,572	61.2	83.5	2,570	8 06	1,267	F	Report on observa-
									tions, ibid. p. 3664.
28	34.0	1,543	60.0	83.0	2,570	7.89	1,218	F	
29	34.2	1,530	59.5	85.4	2,570	8.01	1,226	F	
30	34.2	1,570	61.1	84.6	2,570	7 93	1,245	F	
May... 2	34.2	1,603	62.4	85.3	2,570	8.04	1,288	F	
3	34.2	1,588	61.8	86.3	2,570	8.08	1,283	F	
1893.									
Feb....24	30.0	1,537	47.0	70.0	3,268	6.31	970	F	Tennessee end of 1893
25	30.5	1,524	46.6	66.6	3,268	6.90	1,051	F	section is 10.0' below
28	31.4	1,537	46.9	71.1	3,276	6.91	1,062	F	Fulton Landing.
March 1	31.7	1,573	48.0	69.3	3,278	7.19	1,131	F	Observations by M. R.
2	31.9	1,608	49.1	74.5	3,278	6.82	1,097	F	C. 1st Dist officer.
									Reduction of obser-
3	32.0	1,634	49.8	73 8	3 282	.....	.....	.....	vations of 1891, 1892
4	32.2	1,636	49.8	75.0	3,284	7.43	1,216	F	and 1893 in Secreta-
6	31.8	1,609	49 0	75.0	3,284	6.76	1,088	F	ry's office
7	31.1	1,585	48.4	73 8	3,272	6.67	1,057	F	Tabulation of 1893 ob-
May... 5	32.8	1,635	49.5	73.3	3,295	6.86	1,120	F	servations in Report
8	33.9	1,667	50.6	75.6	3,296	7.35	1,225	F	C. of E. 1894, p. ...

Mississippi River.—Fulton, Tenn.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1893.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
May....10	34.4	1,906	57.8	79.5	3,296	7.03	1,340	F	M = meter.
11	34.5	1 758	53 3	73.8	3,296	7 19	1,264	F	F = double floats.
13	34.6	1,725	52 3	75.6	3,296	7.36	1,270	F	R = rod floats.
16	34.6	1,751	53.1	76.7	3,297	6.90	1,208	F	
17	34.6	1,774	53.8	76.1	3,297	7.11	1,262	F	
19	34 4	1,719	52.1	72.2	3,297	6 74	1,158	F	
23	33.1	1,664	50.5	71.1	3,297	6 60	1,098	F	

Mississippi River.—Memphis, Tenn.

1882.									
Dec....29	8.4	687	.....	.....	.....	4.82	296		Discharge section on either side of President's Isl. Tabulation, Report C. of E. 1884, p. 2806. Observations and reduction by M. R. C. 2d dist. officer. Discharge section 1890, was about 3500' above the bridge. Observations and reduction by M. R. C. 2d dist. officer. Tabulation and report on observations in Report C. of E. 1890, p. 3217.
31	9.8	752	.....	.....	.....	4.30	323	F	
1883.									
Jan.... 2	10.4	774	.....	.....	.....	4.46	346		
Feb....20	32.8	2,439	.....	.....	.....	4.75	1,167		
21	33.3	2,496	.....	.....	.....	4.78	1,194		
1890.									
March.17	35.6	1,596	56.0	107.0	2,850	8.36	1,335		
18	35.5	1,544	54.2	107.0	2,851	8.24	1,273		
20	35 5	1,535	53.9	105.0	2,851	8.76	1,345		
22	35.6	1,448	50.8	109.0	2,851	8.51	1,232		
24	35.6	1,515	53.1	107.0	2,851	8.69	1,316		
25	35.6	1,520	53.3	108.0	2,851	8.50	1,292		
26	35.5	1,466	51.4	104 0	2,851	8.83	1,295		
27	35.4	1,480	51.9	105.0	2,851	8.54	1,264		
29	35.3	1,522	53.4	96.0	2,851	8.46	1,289		
31	35.3	1,577	55.3	104.0	2,851	8.32	1,313		
April.. 1	35.4	1,454	51.0	97.0	2,851	8.29	1,205		
1891.									
March. 6	34.0	1,488	52.8	106.0	2,819	8.59	1,278		
7	34.3	1,424	50.5	103.5	2,819	8.65	1,232		
10	34.9	1,520	54.0	106.0	2,814	8.48	1,289		
Sept.. 29	3.6	698	38.1	74.0	1,829	1.78	125		The low water section of 1891 is about 2¾ miles above the high water section which was the same as in 1890. Tabulation in Report C. of E. 1892, p. 3129. Report on observations, ibid. p. 3118. Observations by M. R. C. 2d dist. officer. Reduction in Secretary's office.
30	3.4	703	38.4	71.0	1,829	1.70	120	M	
Oct.... 1	3.2	698	38.1	74.0	1,829	1.69	118		
2	3.0	682	37.3	75.0	1,829	1.73	118		
3	2.8	689	38.4	76.0	1,795	1.67	115		
5	2.4	667	37 3	76.0	1.788	1.82	121		
6	2.2	660	36.9	69.0	1,786	1.67	110		
8	1.9	678	38.0	71.0	1,786	1.49	101		
9	1.8	660	37.3	71.0	1,772	1.52	100		
10	1.7	648	36.6	67.0	1,768	1.45	94		
12	1.4	642	36.4	68.5	1,763	1.41	91		
13	1.3	640	36.3	66.5	1,762	1.53	98		
14	1.3	642	36.5	67.5	1,758	1.49	96		
15	1.4	641	36.5	71.0	1,759	1 52	97		
16	1.4	651	37.0	69.5	1,761	1.40	91		
17	1.6	656	37.2	70.0	1,762	1.48	97		
19	1.8	667	37.6	70.0	1,773	1.64	109		
21	2.0	644	36.2	70.0	1,778	1.61	104		
1892.									
Oct... 25	1.9	715	43.8	88.0	1,631	1.53	109		Section of 1892 same as in 1890 and 1891. Report C. of E. 1894, p —
1894.									
Nov.... 8	−1.4	571	38.4	75.0	1,486	1.47	84	F	
10	−1.3	576	38.8	75.0	1,486	1.46	84		

Discharge section, 1894, at foot of north line of Butler street, Memphis, Tenn.; another range parallel to and 300 feet below this was used for timing floats. Lower float was at middepth.

Observations and reduction made under direction of M. R. C. 2d district officer by Assistant Wm. Gerig.

Readings on the U. S. Engineer gauge are given in table.

There were 12 velocity stations and 16 soundings on the 8th, and 10 velocity stations and 15 soundings on the 10th.

Mississippi River.—Hampton Landing, Ark.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1878.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Dec... 23	20.0	1,383	30 5	37.2	4,534	.....	.....		M = meter.
27	16.9	1,226	.....	.....	.....	3.93	485		F = double floats.
28	15.2	1,167	.....	.....	.....	3.98	464		R = rod floats.
31	10.0	905	20.4	28.2	4,441	.....	.....		
1879.									Section about 12 miles below Memphis.
Jan... 18	13.8	1,099	24.5	30.0	4,483	.....	.....		The gauge tabulated was established on the Arkansas side near the section. Its zero was 4.40 ft. below the zero of the Memphis standard gauge. Soundings were taken only on those days for which the depths are tabulated.
22	23.0	1,567	34.4	40.6	4,553	.....	.....		
23	25.0	1,661	.....	.....	.....	4.87	809		
24	26.4	1,724	.....	.....	.....	4.86	838		
30	28.5	1,874	41.0	47.6	4,569	.....	.....		
Feb... 2	26.7	1,786	.....	.....	.....	4.54	811		
5	25.4	1,727	.....	.....	.....	4.50	778		
6	25.3	1,722	.....	.....	.....	4.55	783		
7	25.3	1,722	.....	.....	.....	4.54	782		
8	25.7	1,740	.....	.....	.....	4.60	801		
12	27.0	1,799	.....	.....	.....	4.59	825		
15	25.4	1,727	.....	.....	.....	4.47	772		
18	21.5	1,497	32.9	39.4	4,544	.....	.....		Observations taken under the direction of Major W. H. H. Benyaurd.
19	19.8	1,419	.....	.....	.....	3.98	564		
20	18.2	1,317	.....	.....	.....	3.98	537		
21	17.0	1,293	.....	.....	.....	3.83	495		Tabulation, Report C. of E. 1887, p. 2707. Report on observations, ibid. p. 2701.
24	17.7	1,324	.....	.....	.....	3.96	524		
27	19.0	1,383	.....	.....	.....	4.11	568		
28	19.1	1,387	.....	.....	.....	4.13	573		
March. 5	17.5	1,315	.....	.....	.....	3.93	517		
6	17.2	1,301	.....	.....	.....	3.92	511		
7	17.1	1,297	.....	.....	.....	3.82	495		
11	16.8	1,281	27.9	34.1	4,509	.....	.....		
12	16.4	1,243	.....	.....	.....	3.93	489		
13	16.1	1,230	.....	.....	.....	3.96	486		
19	19.8	1,397	.....	.....	.....	4.16	581		
21	21.2	1,461	.....	.....	.....	4.28	625		
22	21.8	1,488	.....	.....	.....	4.35	647		
24	22 5	1,556	34.1	40.7	4,558	.....	.....	F	
25	22.9	1,574	.....	.....	.....	4.27	672	F	
28	24.6	1,652	.....	.....	.....	4 44	734		
April.. 2	25.1	1,675	.....	.....	.....	4.36	729		
5	24.5	1,647	.....	.....	.....	4.37	719		
7	24.7	1,648	36.1	44.5	4,566	.....	.....		
12	23.7	1,602	.....	.....	.....	4.25	678		
15	23.3	1,584	.....	.....	.....	4.22	668		
23	23.6	1,597	.....	.....	.....	4 27	682		
24	22.8	1,561	.....	.....	.....	4.20	656		
25	22.4	1,543	.....	.....	.....	4.12	635		
28	19.9	1,430	.....	.....	.....	4.03	576		
29	18.7	1,376	.....	.....	.....	3.89	536		
30	17.7	1,254	27.8	35.6	4,514	.....	.....		
May.... 2	15.7	1,164	.....	.....	.....	3.74	435		
5	13.0	1,069	23.9	31.5	4,472	.....	.....		
8	10.6	962	.....	.....	.....	3.42	329		
9	9.9	931	.....	.....	.....	3 35	312		
10	9 3	904	.....	.....	.....	3.21	290		
13	8.2	851	19.3	25.4	4,413	.....	.....		
14	8.2	851	.....	.....	.....	3.18	271		
15	8.0	843	.....	.....	.....	3.16	266		
16	7.9	838	.....	.....	.....	3.23	271		
17	7.8	834	.....	.....	.....	3.21	268		
19	7 3	802	18.2	23.7	4,402	.....	.....		
20	7.2	797	.....	.....	.....	3.17	253		
21	7.1	793	.....	.....	.....	3.22	255		
22	7.1	793	.....	.....	.....	3 22	255		
23	7.0	789	.....	.....	.....	3.23	255		
26	6.2	767	17.5	23.9	4,395	.....	.....		
27	6.1	763	.....	.....	.....	3.11	237		
28	6.0	758	.....	.....	.....	3.11	236		
29	6.0	758	.....	.....	.....	3.12	236		

MISSISSIPPI RIVER.—HAMPTON LANDING, ARK.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS.		Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
			Mean.	Maximum.					
1879.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
June.. 3	7.6	820	18.6	24.8	4,410	.....	.....		M = meter.
4	8.4	.....	.....	.....	.....	.....	.....		F = double floats.
5	9.0	882	.....	.....	.....	3.40	300		R = rod floats.
6	9.5	904	.....	.....	.....	3.57	323		
7	10.0	9.6	.....	.....	.....	3.53	327		
9	11.0	977	21.9	27.4	4,453	.....	.....		
10	11.1	981	.....	.....	.....	3.53	346		
11	11.0	977	.....	.....	.....	3.53	344		
12	10.9	972	.....	.....	.....	3.54	344		
13	10.8	968	.....	.....	.....	3.59	348	F	
14	10.7	964	.....	.....	.....	3.45	332		
16	10.1	937	.....	.....	.....	3.57	335		
17	9.9	920	20.7	26.9	4,444	.....	.....		
18	10.0	924	.....	.....	.....	3.61	333		
19	10.0	924	.....	.....	.....	3.55	328		
21	9.8	915	.....	.....	.....	3.41	312		
23	10.0	924	.....	.....	.....	3.48	322		
24	10.5	946	.....	.....	.....	3.59	340		
25	10.9	964	.....	.....	.....	3.58	345		

Mississippi River.—Helena, Ark.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1879.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
April 4	33.2	.....	.....	.....	.....	4.26	729	F	M = meter.
May....12	16.3	.....	.....	.....	.....	3.23	805	F	F = double floats.
22	14.4	.....	.....	.....	.....	3.57	282	F	R = rod floats.
June... 3	14.2	.....	.....	.....	.....	3.66	295	F	
13	18.3	.....	.....	.....	.....	3.88	386	F	Observations and reduction under Maj. C. B. Comstock. Report C. of E. 1879, p. 1970. The gauge readings for 1879 are as reported by discharge party and differ slightly from the standard records.
1882.									
Jan....17	40.3	2,098	43.5	74 5	4,828	.....	.....		
21	41.7	2,145	44.3	72.0	4,839	5.07	1,088	R	
23	42.2	2,177	44.8	73 0	4,856	5.39	1,174	R	
24	42.4	2,144	44 0	73.2	4,871	5.37	1,151	R	
25	42.6	2,193	45.0	68.5	4,871	5.39	1,181	R	
28	43.3	2,194	45.0	74.8	4,871	(*)	.....		
31	43.8	2,302	47.3	78.5	4,871	5.59	1,287	R	
Feb.... 1	43.9	2,325	47.7	77.8	4,871	5.21	1,212	R	
2	44.0	2,297	47.1	78.5	4,871	4.97	1,142	M	
4	44.4	2,341	48.1	81.3	4,871	4.98	1,166	M	Observations and reduction of 1882 under Secretary M. R. C. Report and tabulation, Report C. of E. 1881, p. 2618.
6	44.6	2,285	46.9	80.0	4,871	4.90	1,119	M	
7	44.8	2,338	48 0	81.5	4,871	5.27	1,231	M	
9	45.4	2,412	49 5	77.5	4,871	5.52	1,330	M	
11	46.0	2,377	48.8	84.0	4,871	5.54	1,317	M	
14	46.6	2,408	49 4	81 0	4,871	5.90	1,420	M	
15	46.6	2,333?	47.9	74.6	4,871	5.78	1,348	M	* Observations imperfect.
17	46.3	2,356	48.4	82.0	4,871	5.70	1,343	M	
18	46.1	2,335	47.9	81.4	4,871	6.00	1,400	M	The gauge readings are all referred to the zero of the U. S. Engineer gauge at Helena, whose zero is 161.98′ above the Cairo datum plane.
24	45.5	2,214	45.5	79 8	4,871	5.81	1,287	M	
25	45.5	2,249	46.2	80.2	4,871	5.50	1,238	M	
28	45.5	2,280	46.8	81.4	4,871	5.47	1,247	M	
March. 2	45.6	2,287	47.0	83.3	4,871	5.43	1,241	M	
3	45.7	2,293	47.1	78.2	4,871	5.60	1,285	M	
7	47.0	2,342	48.1	84 0	4,871	6.43	1,506	M	
8	47.1	2,334	47.9	86.8	4,871	6.68	1,558	M	
13	46.5	2,282	46.8	82.3	4,871	6.85	1,562	R	
14	46.4	2,270	46.6	81.8	4,871	6.67	1,513	R	
15	46.2	2,255	46.3	83 0	4,871	6.26	1,412	R	
17	46.0	2,238	45.5	78.5	4,871	6.41	1,434	R	
23	45.2	2,203	44 9	81.5	4,871	.....	.....		
27	44.9	2,261	46 1	82.9	4,871	6.09	1,378	M	
29	44.7	2,203	45.0	84.2	4,871	5.71	1,259	M	
30	44.5	2,203	45.0	84.1	4,871	5.93	1,306	M	
31	44.4	2,270	46.4	83.6	4,871	5.80	1,317	M	
April.. 3	43.8	2,232	45.8	81.6	4,870	5.56	1,241	M	
4	43.6	2,216	45.5	81.4	4,870	5.55	1,230	M	
6	43.3	2,181	44 8	81.6	4,870	5.55	1,210	M	
7	43.1	2,223	45.6	82.0	4,870	5.77	1,287	M	
8	42.8	2,210	45.4	81.7	4,870	5.48	1,282	M	
10	42.4	2,177	44.9	82.5	4,854	5.10	1,110	M	
11	42.1	2,163	44.6	82.3	4,854	5.37	1,162	M	
12	41.7	2,140	44.3	83.3	4,835	5.11	1,093	M	
13	41.4	2,138	44.2	81.2	4,835	5.02	1,073	M	
14	41.1	2,126	44.0	80.9	4,835	4.81	1,023	M	
15	40.8	2,019	41.8	81.1	4,833	4.78	965	M	
17	40.3	1,974	40.9	79.1	4,830	4.84	957	M	
19	40.0	1,992	41.3	82.1	4,830	4.82	959	M	
20	39.9	1,997	41.4	81.4	4,828	4.75	949	M	
21	39.7	2,038	42.2	82.2	4,828	4.62	940	M	
24	38.1	1,871	38.8	77.8	4,828	4.45	833	M	
25	37.8	1,894	39.2	78.5	4,827	4.24	803	M	
26	36.4	1,853	38 4	77.1	4,826	4.32	800	M	
27	35.6	1,782	36 9	77.1	4,826	4.30	765	M	
29	35.0	1,813	37.6	75.2	4,825	4.25	771	M	
May... 1	35.0	1,770	36.7	76.2	4,825	4.33	767	M	
2	35.0	1,797	37.2	76.1	4,825	4.38	788	M	
3	35.1	1,800	37.3	76.2	4,825	4.22	760	M	
4	35.1	1,811	37.5	75.9	4,825	4.37	791	M	
5	35.2	1,836	38.1	76.8	4,825	4 36	801	M	
8	35.4	1,834	38.0	76.2	4,825	4.32	792	M	

Mississippi River.—Helena, Ark.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
May.... 9	35.6	1,818	37.7	78.5	4,826	4.70	856	M	M = meter.
10	36.4	1,846	38.2	77.9	4,826	4.32	798	M	F = double floats.
11	37.0	1,863	38 6	78.5	4,828	4.62	861	M	R = rod floats.
12	38.1	1,920	39.8	78.9	4,828	4.50	868	M	
13	39.0	1,958	40.5	80.2	4,829	4.63	906	M	
16	40.6	2,018	41.8	81.7	4,831	5.03	1,016	M	
17	41.0	2,116	43.8	80.9	4,833	5.09	1,078	M	
18	41.2	2,102	43.5	80.5	4,833	5.12	1,077	M	
20	41 6	2,109	43.6	81.8	4,835	5.27	1,112	M	
22	41.8	2,145	44.3	83.1	4,837	5.14	1,104	M	
23	41.8	2,107	43.6	83.2	4,837	5.35	1,127	M	
24	41.9	2,130	44.0	83.1	4,837	5.07	1,080	M	
25	41.9	2,106	43 5	81.2	4,837	5.23	1,101	M	
26	41.8	2,153	44 5	82.5	4,837	5.04	1,086	M	
27	41.8	2,136	44.2	82.3	4,837	5.31	1,145	M	
29	41.8	2,159	44.6	83.1	4,837	5.05	1,090	M	
30	41.6	2,106	43 6	82.5	4,835	5.30	1,117	M	
June... 1	41.3	2,155	44.6	83 1	4,834	5 08	1,096	M	
2	41 2	2,124	44.0	83.1	4,833	5.01	1,065	M	
3	41.1	2,114	43.7	82.0	4,833	4.93	1,044	M	
5	41.1	2,103	43.5	82.7	4,833	5.04	1,059	M	
8	41.3	2,110	43 4	83.3	4,834	4.94	1,037	M	
10	41.3	2,099	43.4	82.5	4,834	5.13	1,077	M	
12	41 4	2,111	43.7	81.1	4,834	5.09	1,075	M	
16	41.0	2,125	43.9	78.0	4,833	4.84	1,029	R	
20	39.2	2,021	41 9	78.1	4,828	4.52	958	M	
21	38.8	1,948	40.3	78.5	4,828	4.84	944	M	
22	38 8	1,9?0	41.0	78.5	4,827	4.72	984	M	
23	38.8	1,946	40.3	78.6	4,828	4.73	920	M	
27	39.6	1,992	41.3	76.1	4,828	4.91	978	M	
28	39.7	1,969	40.8	77.1	4,828	4.91	972	M	
29	39.7	2,024	41.9	75.5	4,828	4.66	942	M	
30	39.7	2,040	43.2	74 7	4,828	5.10	1,041	M	
July... 1	39.5	1,979	41.0	77.2	4,828	4.81	952	M	
3	39.2	1,974	40.9	77.7	4,828	4.96	979	M	
5	38.8	1,938	40.2	76.5	4,828	4.99	968	M	
7	38.8	1,963	40.7	76.3	4,828	4.84	949	M	
12	39.7	2,013	41.7	78.9	4,828	5.06	1,019	M	
13	39 8	2,021	41.9	76.5	4,828	4.90	991	M	
14	39.8	1,983	41.1	78.7	4,828	5.08	1,008	M	
15	39.6	1,992	41.2	77.3	4,828	5.16	1,029	M	
17	39.1	1,961	40 6	78.0	4,828	4.64	911	M	
18	38.6	1,937	40.4	78 5	4,827	4.68	907	M	
19	38.0	1,930	40.0	77.5	4,827	4.65	898	M	
20	37.3	1,889	39.1	76.4	4,827	4.55	860	M	
22	35 4	1,826	37.8	72.5	4,827	4.38	800	M	
24	33.6	1,708	35.4	69 9	4,825	4.25	728	M	
25	32.8	1,683	35.0	70.3	4,805	4.30	724	M	
26	32.0	1,629	34.1	69 6	4,782	4.22	687	M	
27	31.0	1,603	33.7	68 8	4,756	4.12	660	M	
29	28.7	1,466	30.9	67.2	4,745	4.07	595	M	
31	26.2	1,355	28.8	64.5	4,710	3.99	540	M	
Aug.... 1	25.2	1,301	27.7	62.3	4,689	3.86	502	M	
2	24.2	1,216	26.1	63.7	4,667	3.81	463	M	
3	23.5	1,161	24.9	62.5	4,654	3.78	439	M	
5	22.6	1,111	24 0	62.1	4,639	3.80	422	M	
7	21.8	1,120	24.2	65.3	4,632	3.76	421	M	
8	22.0	1,115	24.1	61.8	4,634	3.74	417	M	
9	22.7	1,168	25.2	62.1	4,637	4.01	469	M	
10	23.6	1,212	26.0	62.8	4,655	3.97	481	M	
11	24.2	1,264	27.1	63.4	4,666	3.86	488	M	
12	24.5	1 278	27.4	61.1	4,670	3.91	500	M	Aug. 17 rod floats gave mean velocity =3.66′ and discharge =455,787 cu. ft. per sec.
14	24 0	1,320	28.3	64.0	4,663	3.96	522	M	
16	23.4	1,196	25 6	62.5	4,662	3.82	456	M	
17	23.1	1,238	26.6	61.5	4,659	3.88	480	M	

MISSISSIPPI RIVER.—HELENA, ARK.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	100 sq.ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Aug....18	22.6	1,219	26.2	61.9	4,656	3.83	467	M	M = meter.
19	22.1	1,199	25.8	60.2	4,653	3.65	437	R	F = double floats
21	21.4	1,118	24.0	61.8	4,648	3.72	416	M	R = rod floats.
22	21.1	1,120	24.1	62.8	4,643	3.77	422	M	
23	20.8	.....	.....	.....	.....	3.66	410	R	For notes see p. 52.
24	20.3	1,118	24.2	62.5	4,626	3.65	409	M	
25	19.8	1,040	22.5	62.5	4,616	3.55	369	M	
26	19.2	974	21.2	60.6	4,603	3.64	354	M	
28	17.9	895	19.6	54.8	4,574	3 50	310	M	
29	17.3	921	20.2	58.2	4,562	3.53	325	M	
30	16.8	897	19.7	57.5	4,550	3.61	324	R	
31	16.4	823	18.1	56 0	4,540	3.38	278	M	
Sept... 2	15.8	829	20.7	57.7	4,000	3.35	277	R	
5	15.6	830	22.1	56.4	3,750	3.22	267	R	
6	15.6	783	20.9	57.2	3,750	3.17	248	R	
8	15.8	836	22.2	55.1	3,770	3.62	302	M	
9	15.8	878	22.0	54.2	4,000	3.38	297	R	
11	16.2	841	21.0	54.8	4,015	3.48	293	M	
13	16.3	916	22.8	55.8	4,020	3.47	318	M	
15	16.0	894	22.3	55.4	4,010	3.70	331	M	
16	15.7	854	22.7	55.1	3,760	3.51	300	M	
18	15.0	842	22.5	54.9	3,740	3.22	271	R	
19	14.9	794	21 3	55 8	3,780	3.39	269	R	
20	15.2	804	21.4	54.6	3,750	3.41	274	R	
22	17.1	894	20.2	56.2	4,419	3.67	328	R	
23	17.9	898	19.4	53.9	4,633	3.43	308	M	
25	17.9	947	20.4	58.3	4,633	3.74	354	R	
26	17.3	911	19.7	56.7	4,625	3.63	331	R	
27	16.5	856	18.6	56.0	4,595	3.46	296	R	
28	15.7	812	21.3	54 9	3,809	3.29	267	R	
29	15.0	798	21.3	53.9	3,780	2.94	233	M	
29	.....	.....	.....	.....	.....	3.16	251	R	
30	14.2	768	21.6	53.6	3,546	3.28	252	R	
Oct.... 2	13.0	753	22.0	54.0	3,420	3.21	242	R	
3	12.6	725	21.5	53.6	3,357	2.79	202	M	
3	12.6	725	21.5	53.6	3,357	3.10	224	R	
4	12.2	709	21.7	53.2	3,282	3.11	220	R	
5	11.6	702	21.7	52.7	3,226	2.96	208	R	
5	.....	.....	.....	.....	.....	2.81	197	M	
6	11.5	681	22.2	52.4	3,060	2.83	193	M	
6	11.5	681	22.2	52.4	3,060	2.98	203	R	
7	11.5	674	22.0	52.0	3,060	2.76	186	M	
7	.....	.....	.....	.....	.....	2.92	197	R	
9	11.5	676	22.1	52.0	3,060	2.96	200	M	
9	.....	.....	.....	.....	.....	2.98	201	R	
10	11.4	650	21.2	52.5	3,053	2.98	194	M	
10	.....	.....	.....	.....	.....	3.04	197	R	
11	11.3	652	21.4	52.8	3,037	2.93	191	R	
14	11.1	637	20.9	52.4	3,037	2.95	188	R	
17	10.7	643	21.3	52.2	3,014	2.80	180	R	
19	10.4	640	21.5	52.5	2,970	2.72	174	R	
20	10.1	607	20.4	51.3	2,970	2.79	169	M	
20	.....	.....	.....	.....	.....	2.77	168	R	
21	9.8	595	20.0	49.5	2,970	2.89	172	M	
21	.....	.....	.....	.....	.....	2.76	164	R	
23	9.8	591	19.9	49.5	2,970	2.79	165	M	
23	.....	.....	.....	.....	.....	2.79	165	R	
24	9.8	591	19.9	49.5	2,970	2.91	172	M	
24	.....	.....	.....	.....	.....	2.73	162	R	
25	9.8	593	19.9	49.5	2,970	2.91	172	M	
25	9.8	593	19.9	49.5	2,970	2.76	164	R	
27	10.2	603	20.3	50.0	2,970	2.95	178	M	
28	10.2	604	20.3	50.0	2,970	3.08	186	M	
28	.....	.....	.....	.....	.....	2.83	171	R	
31	10.3	606	20.4	50.1	2,970	3.06	185	R	

MISSISSIPPI RIVER.—HELENA, ARK.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1883.	feet.	100sq.ft	feet.	feet.	feet.	feet.	1000 cu.ft.		
Nov... 8	10.9	619	22.4	51.9	2,761	3 33	206	M	M = meter.
10	11.0	628	22.7	52.0	2,761	3.32	208	M	F = double floats.
11	11.1	627	22.7	52.1	2,765	3.36	211	M	R = rod floats.
1884.									
Oct ... 3	14.4	812	17.7	54.0	4,590	.....	.....		Observations Oct. 3 to 11 regarded as doubtful.
4	16.2	931	20.2	57.0	4.604	4.14	386	R	
6	19.0	1,076	23.2	60.0	4,634	4.16	448	R	
8	20.2	1,144	24.6	62 0	4,644	3.70	423	M	
9	20.0	1,120	24.1	62.0	4,644	4.16	466	R	
10	19.5	1,090	23.5	64.5	4,635	3.64	396	M	
11	19.0	1,080	22.2	61.0	4,628	3.77	388	M	
13	18.0	971	21.0	59.0	4,624	3 78	367	M	
14	17 8	979	21.2	61.4	4,616	3.81	373	M	
15	17.5	985	21.4	59.1	4,618	3.70	364	M	
16	17.6	983	21.3	59.6	4,614	3.61	355	M	
17	18.0	1,001	21.6	59.5	4,623	3.92	*393	M	*Results doubtful; observer says reject.
18	18 3	979	21 2	58.6	4,625	3.64	356	M	
20	18.4	1,003	21.7	59.6	4,625	3.73	374	M	
21	18.4	1,000	21.6	59.5	4,626	3.69	369	M	Observations and reduction under Secretary M. R. C. Report C. of E. 1887, p. 2820.
22	18.2	993	21.5	60.0	4,624	3.73	371	M	
23	17.8	974	21.1	58.5	4,621	3.55	346	M	
25	16.9	938	20.0	59.4	4,618	3.81	358	M	
27	16.3	896	19.4	59 2	4,609	3.72	334	M	
28	16.0	882	19.2	59.0	4,607	3.85	340	M	The high water sect'n was a short distance below the elevator. The left bank end of the section of 1884-5 was coincident with that of 1882; but the right bank end was about 200' above that of 1882. The low water section was about three-fourths of a mile above the high water section.
29	16.1	872	18.9	58.9	4,606	3.84	335	M	
30	16.2	884	19.2	59.4	4,608	3.77	333	M	
31	16.4	878	19.0	59.4	4,610	3 85	338	M	
Nov.... 1	16.3	889	19 3	57 4	4,610	3.74	333	M	
3	16.0	871	18.9	57.9	4,609	3.77	328	M	
4	15.8	863	18.7	58.0	4,607	3.82	329	M	
5	15.5	859	18.6	57.0	4,606	3.69	317	M	
6	15 2	846	18.4	57.5	4,597	3.83	324	M	
7	14.8	828	18.0	56.8	4,594	3.71	308	M	
8	14.2	797	17.4	56 5	4,588	3.70	295	M	
10	13.1	755	16.5	55.5	4,569	3.75	283	M	
11	12 6	752	16.5	57.0	4,567	3.75	282	M	
12	12.1	722	15 9	58.0	4,555	3.69	267	M	
13	11.8	683	15.0	54.0	4.543	3.74	255	M	
14	11.3	669	14.7	52.5	4,541	3.72	249	M	
15	11.0	642	14.1	52.0	4,536	3.69	237	M	
17	10.3	613	13.5	53.3	4,528	3.74	229	M	
18	10.0	603	13.3	53.0	4,521	3.72	224	M	
19	9.9	584	12.9	53.2	4,519	3.76	219	M	
20	9.7	570	12 6	53.5	4,516	3.60	*205	M	
21	9.6	547	16.8	52.5	3,260	3.80	208	M	
22	9.5	543	16.7	52.0	3,260	3.89	212	M	
24	9.4	541	16.6	52.0	3,260	3.82	206	M	
25	9.3	545	16.7	53.0	3,259	3.86	210	M	
26	9.1	534	17.2	52.5	3,110	3 76	201	M	
†27	8.9	665	18.7	25.0	3,554	2.95	196	M	†Excepting Dec. 4 and 9 the low water section was used from Nov. 27 to Jan. 7.
28	8.9	655	18 4	25.0	3,555	3.17	208	M	
29	9.1	655	18.4	25.0	3,556	3.12	205	M	
Dec.... 1	10.5	708	19 6	25.1	3,611	3 08	218	M	
2	10.8	718	19.7	26.5	3,638	3.09	222	M	
3	11.0	715	19 7	26.0	3,638	3.14	225	M	
4	10.8	715	19.7	26.0	3,632	3.06	219	M	
† 4	10.8	639	14.1	53.0	4,535	3.82	244	M	
5	10.6	705	19.5	26.0	3,618	3.07	217	M	
6	10.3	695	19.3	26.0	3,608	3.26	226	M	
8	9.0	647	18.1	25.0	3,571	2.91	188	M	
9	8.4	631	17.7	24.0	3,558	2.85	180	M	
† 9	8.3	502	15.8	51.0	3,190	3.59	180	M	
10	7.9	614	17.3	23.0	3,547	2 82	173	M	
11	7.5	599	17.0	23 0	3,521	2.83	170	M	
12	7.2	590	16.8	23.0	3,520	2.87	169	M	
13	7.2	587	16 7	22.0	3,517	2.88	169	M	

MISSISSIPPI RIVER.—HELENA, ARK.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1884.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Dec....15	8.5	635	17.8	28 5	3,567	3.04	193	M	M = meter.
16	9 8	677	18.8	25 0	3,598	3.16	214	M	F = double floats.
17	10 9	719	19.8	27 0	3,638	3 15	226	M	R = red floats.
18	12.1	765	20.7	27.5	3,688	3.24	248	M	
19	13.3	805	21.6	28.5	3,735	3.27	264	M	
20	14.1	835	22.1	29.5	3,774	3.28	274	M	
22	15.2	883	23.2	31.0	3,811	3.35	296	M	
23	15.2	873	22.9	31.0	3,808	3.35	292	M	
30	15.1	870	22.9	29.9	3,806	3.49	304	M	
31	17.6	978	24.9	32.5	3,931	3.72	364	M	
1885.									
Jan.... 1	20.7	1,102	26.4	35.5	4,173	3.88	428	M	
2	24.0	1,250	29.6	40.0	4,221	4.11	514	M	
5	26.9	1,370	32.2	43.5	4,253	4.42	605	M	
7	31.9	1,550	35.7	47.0	4,338	4.60	713	M	Chute discharge, 3500
†7	32.0	1,636	34.3	76 0	4,774	4.22	690	M	cu. ft., not included.
8	32.2	1,627	34.0	76.0	4,779	4.39	714	M	† High water section.
9	32.5	1,646	34.4	75.2	4,781	4.30	707	M	
10	32.8	1,668	34.9	75.0	4,783	4.24	708	M	
12	33.6	1,707	35.6	76.5	4,800	4.42	754	M	
13	34.4	1,749	36.4	77.6	4,805	4.47	781	M	
14	35.0	1,773	36 8	78.6	4,820	4.47	792	M	
17	36.9	1,860	38.5	79.0	4,829	4.44	826	M	
19	37.6	1,883	39 1	79.5	4,861	4.50	850	M	
20	38.0	1,895	39.2	81.5	4,881	4.60	873	M	
21	38.3	1,923	39.8	82.2	4,881	4.71	907	M	
22	38.7	1,950	40.4	82.2	4,881	4 71	918	M	
26	40.1	2,014	41.6	83.5	4,841	4.82	970	M	
27	40.4	2,047	42.2	83.5	4,850	4.82	987	M	
28	40.5	2,054	42.4	83.5	4,851	4.96	1,021	M	
29	40.6	2,061	42.5	80.5	4,851	4.91	1,013	M	
Feb.... 2	38.5	1,937	40.0	80.0	4,844	4.54	879	M	
3	36.8	1,852	38.3	79.0	4 836	4.40	816	M	
4	34.9	1,760	36.6	78.0	4,816	4.12	726	M	
5	32.7	1,636	34.3	78.0	4,778	4 20	687	M	
6	30.9	1,562	32.8	74.0	4,766	3.98	622	M	
7	29.2	1,488	31.4	72.0	4,739	4.20	625	M	
9	27.0	1,387	29.0	68.0	4,709	4.07	557	M	
10	26.6	1,348	28 6	69.0	4,707	4.04	545	M	
11	26.5	1,349	28.7	70.0	4,707	4.00	539	M	
12	26.7	1,370	29.1	70.0	4,707	4.03	552	M	
13	26.9	1,370	29.1	70.0	4,708	4.04	553	M	
14	27.0	1,357	28.8	69.0	4,714	3.98	541	M	
19	29.5	1,464	30.9	72.0	4,743	4.11	601	M	
20	29.4	1,450	30.6	71.0	4,743	4.13	599	M	
28	18.4	909	19.7	58.0	4,621	3.98	361	M	
March. 2	16.8	844	18.3	57.0	4,607	3.95	334	M	
3	16.5	831	18.0	56.0	4,606	3 95	328	M	
4	16.5	838	18.2	54.0	4,606	4.00	336	M	
5	16 8	849	18.4	55 0	4,612	3 97	337	M	
6	17.4	879	19.0	54.0	4,616	4.04	355	M	
7	18.3	915	19.8	57.0	4,625	4.05	370	M	
9	20.4	1,012	21.8	57.0	4,645	4.18	423	M	
10	21.9	1,076	23.1	59.0	4,655	4.25	457	M	
11	23.7	1,163	24.9	60.5	4,670	4 22	491	M	
12	25.8	1,272	27.1	63.0	4,695	4.49	571	M	
13	27.5	1,357	28.7	64.4	4,725	4.26	578	M	
14	28.7	1,424	30.0	64 7	4,741	4 43	631	M	
16	30.0	1,489	31.4	67.3	4,747	4.33	644	M	
17	30.7	1,527	32.3	67.6	4,757	4.34	667	M	
18	31.6	1,573	33.0	67.6	4,767	4.43	698	M	
19	32 4	1,611	33.7	69.5	4,775	4.45	717	M	
20	33.1	1,647	34.4	70.0	4,787	4.47	737	M	
23	33 6	1,672	34.8	72.0	4,802	4.41	738	M	
24	33.4	1,670	34 8	71.0	4,801	4.34	724	M	
25	33.2	1,650	34.4	70.0	4,798	4.22	696	M	
26	32.9	1,634	34.1	70.5	4,787	4.25	694	M	

Mississippi River.—Helena, Ark.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1885.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
March. 27	32.8	1,617	33.9	69.0	4,773	4.21	681	M	M = meter.
28	31.5	1,588	33.3	70.0	4,767	4.17	663	M	F = double floats.
30	29.6	1,478	31.2	69.0	4,741	4.15	614	M	R = rod floats.
31	28.8	1,420	30.0	66.0	4,729	3.94	560	M	
April.. 1	26 9	1,346	28.6	65.0	4,712	3.98	536	M	
2	25.6	1,296	27.6	64.0	4,691	3.98	516	M	
3	24.7	1,249	26.7	62.6	4,679	4.04	504	M	
4	23.9	1,197	25.6	63.4	4,669	3.86	462	M	
7	23.1	1,155	24.7	63.3	4,669	3.92	453	M	
9	24.7	1,240	26.5	65.2	4,684	4.15	515	M	
10	26.2	1,308	27.8	65.4	4,700	4.14	542	M	
1888.									
Nov... 28	26.7	1,340	28.3	75.0	4,732	4.22	565	M	Observations and reduction by M. R. C. 2d dist. officer. Report C. of E. 1890, p. 3158.
29	26.0	1,295	27.4	72.0	4,725	4.39	569	M	
30	25.0	1,251	26.5	74.4	4,722	4.38	548	M	
Dec ... 1	23.8	1,184	25.1	72.0	4,715	4.38	519	M	
3	21.1	1,079	22.9	73.0	4,702	4.57	493	M	
4	19.9	985	23.1	74.0	3,505	4.64	457	M	
5	18.6	926	23.5	71.0	3,244	4.77	442	M	The section was in about the same place as in 1883 and 1884.
6	17.3	886	23.6	67.0	3,090	4.72	418	M	
7	16.0	836	23.5	68.0	2,988	4.40	368	M	
8	14.7	815	23.3	68.5	2,887	4.10	334	M	
10	12.7	699	26.1	61.0	2,690	4.06	284	M	
11	11.8	676	25.3	64.0	2,670	3.93	266	M	
12	11.1	673	25.2	61.2	2,666	4.06	273	M	
13	10.5	654	25.5	62.3	2,565	4.10	269	M	
14	10.0	641	25.6	62.5	2,505	3.95	253	M	
16	9.4	619	24.8	60.2	2,500	3.93	243	M	
17	9.4	625	25.0	62.3	2,500	3.93	246	M	
18	9.2	626	25.0	61.0	2,500	3.83	240	M	
19	9.1	614	24.7	60.0	2,490	3.91	240	M	
20	9.0	620	25.0	60.0	2,475	3.89	241	M	
21	8.9	604	24.5	60.0	2,473	3.92	237	M	
22	9.0	602	24.4	60.0	2,470	3.82	229	M	
24	9.6	614	24.6	56.0	2,500	3.93	241	M	
25	10.2	637	24.9	58.2	2,555	3.95	252	M	
26	11.0	648	25.3	59.0	2,562	4.21	273	M	
27	11.4	663	25.3	59 0	2,620	4.13	274	M	
28	11.7	679	25.4	60 0	2,680	4.13	281	M	
29	12.0	700	26.1	6 0.0	2,680	4.13	289	M	
31	13.1	718	26.5	61.0	2,705	4.14	297	M	
1889.									
Jan.... 1	13.9	751	27.0	63.0	2,785	4.23	318	M	
3	15.3	806	28 0	63.7	2,868	4.24	342	M	
5	15.6	796	27 1	64 0	2,933	4.35	347	M	
7	14.9	773	26.5	63.5	2,888	4.23	327	M	
8	14.5	766	26.7	63.2	2,862	4.17	319	M	
9	14.5	773	27 0	63.7	2,862	4.29	332	M	
10	14.7	772	26.9	63.0	2,873	4.23	327	M	
11	15.4	801	27 5	62.8	2,908	4.47	358	M	
12	16.4	841	28.2	65.3	2,989	4.48	377	M	
14	19.6	946	27.9	67.0	3,394	4.77	450	M	
16	24.3	1,278	27.1	75.0	4,700	4.74	608	M	
17	25.6	1,316	27.8	78.0	4,724	4.78	630	M	
18	26.4	1,339	28.1	78.0	4,734	4.63	620	M	
19	27.0	1,380	29.1	78.5	4,742	4.64	640	M	
21	28.6	1,412	29.6	77.5	4,766	4.65	656	M	
22	29.5	1,458	30.5	79.0	4,777	4.70	685	M	
23	30.4	1,511	31.6	80.0	4,779	5.02	758	M	
24	31.2	1,613	33.7	80.0	4,792	4.80	774	M	
27	30.8	1,494	31.2	79.5	4,787	4.66	696	M	
28	30.1	1,500	31.4	79.5	4,775	4.70	705	M	
29	29.1	1,423	29.9	79.5	4,766	4.70	668	M	
30	28 1	1,349	28.4	77 0	4,755	4.60	620	M	
31	27.2	1,324	27.9	75.0	4,743	4.55	603	M	
Feb.... 1	26 9	1,313	27.7	75.0	4,737	4.50	591	M	
2	26.9	1,337	28.2	77.0	4,740	4.47	598	M	

Mississippi River.—Helena, Ark.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1889.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Feb... 4	27.8	1,366	28.7	76.0	4,756	4.71	643		M = meter.
5	28.4	1,399	29.4	75.2	4,763	4.58	641		F = double floats.
6	29.0	1,408	29.5	75.5	4,776	4.67	658		R = red floats.
7	29.3	1,424	29.8	77.0	4,777	4.71	671		
8	29.3	1,444	30.2	77.2	4,780	4.75	684		For notes see page 87.
9	29.0	1,426	29.8	76.0	4,778	4.60	656		
11	27.0	1,342	28.2	76 0	4,769	4.41	592		
12	25.6	1,284	27.6	75.0	4,728	4.33	556		
13	23.9	1,170	24.8	75.0	4,714	4 42	517		
16	18.6	894	27.1	67.0	3,295	4.35	389		
18	16.2	830	27.1	65.0	3,061	4.26	354		
19	15.2	804	26.9	64.0	2,984	4.20	338		
20	14.5	768	26.6	62.3	2,883	4.19	322		
21	14.7	778	27.0	64.0	2,883	4.39	342		
22	16.6	852	27.1	66.0	3,073	4.69	383		
23	20.5	1,004	25.8	70.5	3,897	4.95	497		
25	26.0	1,291	27.3	74.2	4,731	4.78	611		
26	27.9	1,401	29.4	75.6	4,757	4.80	672		
27	29.5	1,480	30.9	77.0	4,780	4.89	724		
28	31.0	1,557	32.4	79.5	4,802	4.86	756		
March. 2	32.3	1,641	34.1	81.2	4,818	4 87	800		
4	32.1	1,632	33.9	80.5	4,810	4.57	746		
5	31.6	1,608	33.5	80.0	4,804	4.61	741		
6	31.1	1,548	32.3	78.0	4,800	4.56	706		
7	30.8	1,544	32.2	78.0	4,790	4.58	708		
8	30.4	1,515	31.7	78.0	4,785	4.47	678		
9	30.3	1,506	31.5	78.0	4,784	4.45	670		
11	29.5	1,446	30.3	76 3	4,779	4.39	635		
12	28.8	1,413	29 7	75.5	4,764	4 39	620		
13	27.9	1,375	29.3	75.0	4,754	4.38	602		
14	27.0	1,320	27.8	75.0	4,751	4.43	585		
15	26.1	1,274	26.9	73.5	4,735	4.36	556		
16	25.5	1,249	26.4	72.0	4,729	4.34	542	M	
18	24.4	1,180	25.0	73.0	4,723	4.43	523		
19	24.0	1,178	25.0	71.0	4,721	4.36	513		
20	23.6	1,147	24.3	70.5	4,716	4.40	505		
21	22.9	1,111	23.6	72.0	4,713	4.27	474		
22	22.3	1,085	23.0	69.5	4,712	4.24	460		
23	21.8	1,058	22.5	68.0	4,708	4 34	460		
25	21.8	1,056	22.4	68.5	4,708	4.41	466		
26	22.6	1,124	23.9	70.5	4,714	4.44	499		
27	23.8	1,177	24.9	71.0	4,721	4.49	518		
28	24.8	1,230	26.0	72.0	4,731	4.45	547		
April.. 1	25.2	1,257	26.5	74.0	4,732	4.42	555		
3	24.5	1,209	25.6	71.8	4,721	4.28	518		
5	23.4	1,159	24.6	72.3	4,713	4.34	504		
6	22.7	1,141	24.2	72.0	4,711	4.28	488		
8	22.0	1,104	23.5	72.0	4,708	4.24	468		
9	21.9	1,108	23.5	72.5	4,707	4.34	480		
10	21.8	1,110	23.6	73.0	4,707	4.32	479		
11	21.6	1,106	23.5	73.5	4,707	4.27	473		
13	20.8	1,018	23.3	72.5	3,895	4.35	443		
15	19.8	963	23.2	70.0	3,495	4.32	425		
16	19.5	957	23.2	69.1	3,393	4.35	416		
17	19.2	944	27.9	70.0	3,392	4.44	420		
18	18.8	920	27.5	69.0	3,341	4.31	397		
19	18.5	889	27.0	67.5	3,291	4.44	395		
20	18 4	887	26.9	66.7	3,291	4 35	385		
22	19.4	941	27.7	70.0	3,393	4 49	423		
23	20.2	967	26.2	70.3	3,694	4.41	427		
24	20.8	1,022	21.7	69.8	4,708	4.44	454		
25	21.4	1,055	22.4	71.0	4,709	4.40	464		
26	21.9	1,081	22.9	69.2	4,712	4.40	476		
27	22.7	1,109	23.6	70.0	4,714	4.48	497		
29	23.6	1,144	24.3	71.0	4,715	4.48	509		
30	23.2	1,133	24.1	70.2	4,714	4.41	502		

Mississippi River.—Helena, Ark.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1889.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
May.... 1	22.3	1,098	22.3	70.0	4,708	4.27	468		M = meter. F = double floats. R = rod floats.
2	20.8	1,024	21.9	68.5	4,702	4.27	437		
1890.									
April † 3	47.4	2,426	.....	99.0	5,183	6.38	1,547		Observations by M.R. C. 2d district officer. Apr. results reduced in the dist. office. Dec results in the Secretary's office.
4	47.4	2,469	.....	100.0	5,183	6.36	1,570		
5	47.3	2,361	.....	98.0	5,183	6.36	1,501		
¶ 7	47.2	2,363	.....	94.0	5,183	6.18	1,461		
9	47.0	2,312	.....	97.0	5,183	6.05	1,398		
10	47.0	2,368	.....	96.0	5,183	5.88	1,405		
12	47.1	2,356	.....	93.0	5,183	6 13	1,443		
14	47.2	2,330	.....	95.0	5,183	6.29	1,466	M	High water sec'n was about 900' below the wharfboat. Low water section of 1890, and H. W of 1891 was about 7200' below the wharfboat. Tabulation, Report C. of E. 1891, p. 3536.
16	47.4	2,374	.....	96.0	5,183	6.31	1,497		
17	47.5	2,382	.....	95.0	5,183	6.38	1,519		
18	47.3	2,387	.....	97.0	5,183	6.23	1,487		
19	47.0	2,289	.....	94.0	5,182	6.43	1,471		
21	46.0	2,308	.....	94.0	5,182	5.92	1,368		
23	44.5	2,241	.....	92.0	5,181	5.66	1,269		
Dec....23	11.8	640	32.4	51.5	1,973	3.85	246		
a.m 24	11.2	624	31.6	50.0	1,977	3.73	239		
m.24	11.1	630	31.9	50.5	1,977	3.72	235		
26	10.2	603	30.9	49.0	1,955	3 70	223		
27	10.2	600	30.7	49.0	1,955	3.82	* 239		
1891.									
March. 11	43.5	2,176	37.5	82.0	5,795	6.08	1,323		Observations, 1891, by M. R. C. 2d district officer; reduction in Secretary's office. Low water section of 1891 was about 4500' below the wharfboat. Tabulation, Report C. of E., 1892, p. 3130. Report on observations, ibid, p. 3119.
12	43.6	2,187	37.7	83.0	5,795	6.24	1,365		
13	43.7	2,195	37 9	85.0	5,796	6.23	1,368		
17	44.0	2,209	38.1	85.0	5,797	6.24	1,378		
18	44.0	2,233	38.5	85.0	5,797	6.47	1,444		
19	44.1	2,217	38 2	85.0	5,797	6.26	1,389		
20	44.2	2,250	38.8	85.0	5,799	6 32	1,422		
21	44.3	2,258	38.9	85 0	5,799	6.44	1,455		
22	44.4	2,253	38.5	85.0	5,799	6.42	1,433		
23	44.4	2,223	38.3	85.5	5,799	6.39	1,421		
24	44.5	2,249	38 8	86.0	5,800	6.34	1,426		
25	44.7	2,241	38.6	86.0	5,800	6.36	1,426		† Discharge through Austin crevasse, Ap. 8, 87,870 cu. ft. per second. Austin is about 18 miles above Helena.
26	44.7	2,274	39.2	85.0	5,800	6.26	1,423		
27	44.7	2,255	38.9	86.0	5,800	6.35	1,433		
28	44.7	2,295	39.6	86.0	5,800	6.25	1,434		
30	44.7	2,235	38.5	86.0	5,800	.....	.....		
31	44.7	2,270	39.1	87.0	5,800	6.21	1,410		¶Discharge over bank L. N. O. & T. R. R. Apr. 7, 11,205 cu. ft. per second.
April.. 1	44.6	2,248	38.8	87.0	5,800	6 26	1,407		
2	44.5	2,271	39.2	86.0	5,800	6.35	1,442		
3	44.5	2,220	38.3	85 0	5,800	6.35	1,410		
4	44.3	2,211	38.1	85.5	5,800	6.13	1,354		
6	44.1	2,205	38.0	87.5	5,800	6.15	1,356		* The recorded velocity at station 3 for this day seems abnormally high; interpolating a velocity for station 3 as observed on the 24th and 26th, the discharge for this day becomes 224,807 cu. ft. per second.
7	44.1	2,184	37.7	86.5	5,800	6.18	1,351		
8	44.0	2,199	37.9	85 0	5,800	6.15	1,352	F	
9	44.0	2,262	38.0	85.0	5,799	5.95	1,311		
10	44.0	2,224	38.4	86.0	5,799	6.07	1,351		
11	44.0	2 203	38.0	86.0	5,799	6.27	1,381		
13	44.0	2,230	38.5	85.0	5,799	6.19	1,381		
Sept.. 30	4.7	526	31.8	49.5	1,656	2 70	142		
Oct.... 1	4.4	503	30.6	47.8	1,647	2.55	128		
2	4.0	495	30.1	46.8	1,645	2.67	132		
3	3.7	502	30.6	47.3	1,643	2.50	125		
5	3.3	505	30.8	47.7	1,642	2 64	133		
6	3.0	505	30.8	47.7	1,638	2.51	127		
7	2.7	498	30.5	47.9	1,633	2.53	126		
8	2.5	487	29.8	46.9	1,632	2.42	118		
9	2.2	486	29.8	47.1	1,631	2.48	121		
10	2.0	489	30.1	46.8	1,627	2.43	119		
12	1.7	482	29.7	47.3	1,624	2.25	108		
13	1.6	479	29.5	46.6	1,624	2.19	105		
14	1.5	482	29.7	47.1	1,624	2.22	107		
15	1.4	482	29.7	47.1	1,625	2.20	106		
16	1.3	479	29.5	46.8	1,624	2.20	105		

Mississippi River.—Helena, Ark.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1891.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Oct.....17	1.4	472	29.0	46.4	1,625	2.29	108		M = meter.
19	1.8	480	29.5	46.8	1,630	2.43	117		F = double floats.
20	2.0	481	29.5	47.1	1,632	2.44	117		R = rod floats.
21	2.2	490	30.0	47 0	1,635	2.43	119		
22	2.4	488	29.8	46.9	1,638	2.56	125		For notes see p. 59.
23	2.5	491	30.0	47.1	1,640	2.54	125		
24	2.5	487	29.7	46 8	1,640	2.49	121		
26	2.4	486	29.7	46.6	1,639	2.52	123		
28	2.0	482	29.5	46.7	1,635	2.36	113		
29	1.9	478	29.2	46.7	1,633	2.41	115		
30	1.8	476	29.2	46 6	1,631	2.25	107	F	
31	1.7	471	28.9	45.8	1,631	2.20	104		
Nov.... 2	1.6	477	29.2	47.1	1,632	2.41	115		
3	1 5	472	28.9	46.2	1,632	2.30	108		
4	1.4	467	28 6	46.2	1,630	2.32	108		
5	1.3	463	28.4	45.8	1,629	2.32	108		
6	1.1	466	28.7	45.9	1,624	2.29	107		
7	1.0	464	28.6	45.7	1,622	2.24	104		
9	0.9	455	28.0	45.4	1,623	2.40	109		
10	1.0	459	28.2	45.3	1,624	2.32	106		
11	1.0	458	28.2	44.8	1,625	2.29	105		
1892.									
April..18	42.6	2,063	40 5	97.0	5,099	5.21	1,074		Section is approximately same as 1891-'89, and is about 300' below the elevator. Observations of 1892 and 1893 taken under M. R. C. 2d dist. officer. Reduction at Secretary's office. Tabulation, 1892, Report C. of E 1893, p. 3684. Report on observations, ibid. p. 3664.
19	42.7	2,155	42.3	97 0	5,099	4.88	1,040		
20	42.9	2,179	42.7	96.0	5,100	5 04	1,098		
21	43.2	2,159	42.3	96.0	5,101	5.16	1,114		
May... 3	44.5	2,193	42.9	98.4	5,118	5.51	1,209		
4	44.6	2,217	43.3	97.0	5,118	5.44	1,206		
5	44.8	2,234	43 6	96.0	5,118	5.64	1,261		
6	44.9	2,254	44.0	96.0	5,118	5.57	1,256		
7	45.0	2,265	44.3	96.5	5,118	5.45	1,233		
9	45.5	2,278	44.5	96.0	5,119	5.47	1,246		
10	45.7	2,292	44.8	97.0	5,119	5.63	1,290		
11	45.7	2,308	45.1	97.0	5,119	5.75	1,328		
12	45 7	2,295	44.8	97.0	5,119	5.72	1,313		
13	45 5	2,298	44.9	97.0	5,119	5.75	1,321		
14	45 3	2,283	44.6	96.0	5,118	5.76	1,315		
16	44 8	2,258	44.1	96.0	5,117	5.63	1,271		
17	44 6	2,227	43.5	96.0	5,117	5.61	1,250		
June... 1	44.7	2,209	43.2	95.0	5,117	5.65	1,247	M	
2	44.7	2,212	43.2	96.0	5,117	5.40	1,194		
3	44 7	2,183	42.7	95.0	5,117	5.39	1,177		
4	44.6	2,196	42.9	94.0	5,117	5.37	1,180		
6	44.6	2,182	42.6	95.0	5,117	5.43	1,185		
7	44.6	2,191	42.8	96.0	5,117	5.37	1,177		
8	44.6	2,210	43.2	96.0	5,116	5.42	1,198		
9	44.7	2,230	43.6	96.5	5,118	5.40	1,203		
10	44.8	2,245	43 9	96.0	5,118	5.35	1,200		
11	44.9	2,256	44.1	96.0	5,119	5.42	1 222		
13	45 0	2,253	44.0	96.0	5,119	5 36	1,207		
14	45.1	2,264	44.2	96 0	5,119	5.42	1,227		
15	45.1	2,271	44.4	96.0	5,119	5.42	1,231		
16	45.1	2,282	44.6	95.0	5,119	5 47	1,247		
17	45.1	2,271	44.4	96.0	5,119	5.33	1,210		
18	45.0	2,260	44.1	96.0	5,119	5.56	1,255		
20	44.8	2,267	44.3	95.0	5,119	5.46	1,237		
21	44.6	2,248	43.9	96.0	5,119	5.30	1,191		
22	44.4	2,252	44.0	96.0	5,119	5.15	1,161		

Mississippi River.—Helena, Ark.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n, in 100 sq. ft.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	DISCHARGE PER SECOND IN 1000 CUBIC FEET. River.	Bank.	Total.	Method.	Remarks.
1893.	feet.		feet.	feet.	feet.	feet.					
May....9	43.1	1,910	38.3	86 6	4,982	6.19	1,183	7	1,190	M	
10	43.3	1.939	38.9	87 2	4,982	6.20	1,202	†8	1,210	M	
11	43.5	1,9 5	38.2	83.6	4,983	6.24	1,189	8	1,197	M	
12	43.7	1,9-0	39.7	90.0	4,983	6.17	1,221	8	1,229	F	
13	43.8	2,027	40.7	90.4	4,983	6.19	1,255	8	1,264	F	
15	44.2	2,052	41.2	91.3	4,983	6.24	1,280	9	1,289	M	
15	.....	.....	.....	.....	.....	6 32	1,296	9	1,305	F	
16	44 4	2,124	42 6	94.6	4,983	6.46	1,372	9	1,382	M	
16	.....	.....	.....	.....	.....	6.14	1.306	9	1,315	F	
17	44 6	2,061	41.3	91.0	4,984	6.26	1,289	10	1,299	M	
17	44.6	2,061	41 3	91.0	4,984	6 09	1,256	10	1,265	F	
18	44 9	2,115	42 4	91.8	4,984	6.35	1,344	10	1,354	M	
19	45.2	2,002	41.3	89.1	4,985	6.46	1,332	10	1,343	M	
19	.....	.....	.....	.....	.....	6 32	1,302	10	1,313	F	
20	45.7	2,135	42.8	92.7	4,988	6.60	1,410	11	1,421	M	
22	46 9	2,274	45.5	95.6	4.994	6 37	1,449	†13	1,462	F	
23	47.5	2,312	46 3	96.8	4,995	6.83	1,580	14	1,594	M	
23	.....	.....	.....	.....	.....	6 67	1,543	14	1,556	F	
24	47.7	2,183	43.7	93.8	4,999	6.81	1,487	14	1,501	M	
24	.....	.....	.....	.....	.....	6.91	1,508	14	1,512	F	
25	47 9	2,234	44.7	94.0	4,999	6 90	1,540	14	1,555	M	
25	.....	.....	.....	.....	.....	6.98	1,560	14	1,574	F	
26	47.8	2,207	44.1	94.0	4,999	6 86	1,513	14	1,527	M	
26	.....	.....	.....	.....	.....	6.83	1,507	14	1,521	F	
29	47.0	2,178	43.6	92.0	4,998	6.60	1,437	13	1,449	M	
29	47.0	2,178	43 6	92 0	4,998	6.67	1,453	13	1,465	F	
31	45.9	2,108	42 2	.....	4,995	6 52	1,373	11	1,385	M	
June... 1	45.8	2,112	42.3	91.5	4,992	6.64	1,402	11	1,413	M	
1	.....	.....	.....	.....	.....	6.51	1,375	11	1,387	F	
2	45 7	*2,101	42.1	.....	4,992	6.54	1,375	11	1,386	M	
5	45.3	2,066	41.4	91.0	4,990	6 46	1,333	10	1,344	M	

M = meter. F = double floats.

Section was 4500 feet below the wharfboat.

Tabulation, Report C. of E. 1894, p. 2828. Report on work, ibid. p. 2822.

† Observed; floats used.

* Area interpolated from June 1 and 5.

Mississippi River.—Old Town Bend.

1894.										
Nov.8a.m	—2 2	502	28 8	52.5	1,745	1.53	77	.....	.....	M
8p.m	—2.2	502	28.7	52.5	1,745	1.75	88	.....	.....	M
9	—2.2	503	28.8	52.5	1,745	1.75	88	.....	.....	M

Discharge section in Old Town Bend, about 325 miles below Cairo.

The gauge readings in the table are those of the U. S. Engineer gauge at Helena, Arkansas, about 18 miles above the section.

The observations and reduction were made under the direction of the M. R. C. 2d dist. officer, by Ass't Chas. Levassieur.

Mississippi River.—Arkansas City, Ark.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1884.	feet.	100sq.ft	feet.	feet.	feet.	feet.	100 cu.ft.		
Oct..... 6	16.6	1,394	42.5	80.0	3,282	3.26	455	M	M = meter.
7	18.0	1,451	44.2	82.0	3,285	3.34	485	M	F = double floats.
8	19.2	1,540	46.7	82.5	3,298	3.47	535	M	R = rod floats.
9	20.0	1,499	45.4	84.5	3,302	3.59	539	M	
10	20.6	1,599	48.4	84.0	3,302	3.45	552	M	Observations and reduction, of 1884-5, made under direction of the Secretary M. R. C.
13	20.2	1,531	46.4	82 0	3,299	3.15	482	M	
14	19.5	1,501	45.5	82.0	3,299	2.98	447	M	
15	18.8	1,453	44.1	81.5	3,295	2.92	428	M	
16	18.4	1,437	43.6	81.0	3,295	2.83	406	M	
17	18.2	1,436	43.6	80.0	3,295	2.97	427	M	Section about ½ mile below Arkansas City.
18	18.1	1,445	43.8	81.0	3,295	2.86	414	M	
20	18.5	1,445	43.8	81.0	3,296	2.81	405	M	
21	18.5	1,440	43.7	81.5	3,296	2.91	419	M	Report on reduction, and tabulation, in Report C. of E. 1887, p. 2835.
22	18.4	1,434	43 5	80.5	3,295	2.89	414	M	
23	18.2	1,419	43.1	79.5	3,295	2.94	418	M	
24	18.0	1,397	42.4	81.0	3,295	2.82	394	M	
25	17.6	1,385	42.1	81.0	3,286	2.71	375	M	
27	16.8	1,354	41.3	77 0	3,281	2 77	376	M	
28	16.4	1,335	40.7	77.0	3,279	2.68	357	M	
29	16.2	1,315	40.1	77.0	3,277	2.69	354	M	
30	16.0	1,301	39.7	77.0	3,277	2.71	352	M	
31	16.3	1,324	40.4	78.0	3,278	2.66	352	M	
Nov.... 1	16.5	1,345	41.0	78.0	3,282	2.72	3 6	M	
3	16.4	1,311	39.9	77.0	3,282	2.69	352	M	
4	16.2	1,304	39.7	77.0	3,281	2.75	359	M	
5	16.1	1,306	39.8	78.0	3,278	2 77	362	M	
6	16.0	1,309	39.9	77.0	3,277	2.74	359	M	
7	15.7	1,294	39.5	77.0	3,275	2.67	345	M	
8	15.2	1,265	38.7	75.5	3,270	2.67	338	M	
10	14.0	1,215	37.2	76.0	3,265	2.58	313	M	
11	13.4	1,204	36.9	74.0	3,260	2.49	299	M	
12	12.8	1,187	36.5	73.0	3,255	2.50	296	M	
13	12.2	1,158	35.6	72 5	3,251	2.46	285	M	
14	11.7	1,135	34.9	72.0	3,248	2.37	269	M	
15	11.2	1,128	34.8	73.0	3,245	2.38	268	M	
17	10.2	1 083	33.6	70.0	3,224	2.35	254	M	
18	9.8	1,071	33 8	68.5	3,165	2.27	243	M	
19	9.5	1,060	33.6	69.0	3,154	2.47	262	M	
20	9.2	1,048	33.6	69.0	3,119	2.30	241	M	
21	9.0	1,034	33.1	68.5	3,119	2.42	250	M	
22	8.9	1,039	33.3	68.3	3,119	2 44	253	M	
24	8.9	1,030	33.0	68.5	3,119	2.52	270	M	
25	8.8	1,030	33.0	69.0	3,119	2.36	(243)	M	
26	8.7	1,025	32.9	68.5	3,118	2.40	246	M	
27	8.6	1,017	32.7	68.2	3,115	2.34	238	M	
29	8.7	1,016	32.7	68.0	3,115	2.36	241	M	
Dec.... 1	9.8	1,054	33 4	69.0	3,154	2.45	259	M	
2	10.7	1,072	33.2	69.5	3,229	2.64	283	M	
3	11.4	1,103	34.0	69 5	3,245	2.61	288	M	
4	11.9	1,118	34.4	70.0	3,248	2 62	292	M	
5	12.0	1,112	34.2	70.5	3,250	2.58	287	M	† Reject.
†6	11.6	1,107	34.1	69.5	3,248	2.89	320	M	
8	10.3	1.068	33.1	69.5	3,229	2.43	260	M	
9	9.6	1,035	32.8	69.0	3,154	2.43	252	M	
10	8.8	1,004	32.2	68.0	3,119	2.46	248	M	
†11	8.2	983	31.6	67.0	3,115	2.63	258	M	
12	7.8	968	31.1	66.4	3,114	2.42	234	M	
13	7.4	947	30.4	66.4	3,111	2.34	221	M	
15	8.8	997	32.0	67.7	3,115	2.44	243	M	
16	10.9	1,070	33.1	69.2	3,229	2.68	286	M	
17	12.8	1,124	34 5	71.7	3,255	2.85	321	M	
†18	15.0	1 170	35.8	74.7	3,268	2.88	337	M	
19	16 6	1,218	38 0	76.2	3,282	2.92	365	M	
20	17.6	1.274	38.8	78.6	3,286	3.06	390	M	
22	18.4	1,319	40.0	77.6	3,286	3.14	415	M	

MISSISSIPPI RIVER.—ARKANSAS CITY, ARK.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1884.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Dec....23	18.4	1,283	38.9	78.1	3,296	3.06	393	M	M = meter.
24	18.1	1,290	39.1	78.4	3,295	3.08	397	M	F = double floats.
26	16.8	1,234	37.6	75.8	3,281	2.96	365	M	R = rod floats.
29	15.0	1,174	35.9	73.5	3,270	2.90	340	M	
30	16.8	1,215	37.0	75.0	3,281	3.09	376	M	
31	20.3	1,314	39.8	77.2	3,299	3.49	458	M	
1885.									
Jan ... 1	23.3	1,424	43.1	77.7	3,305	3.91	557	M	
2	26.1	1,545	46.6	82.6	3,313	4.12	637	M	
3	28.7	1,625	48.8	87.0	3,328	4.43	720	M	
7	35.6	1,845	54.9	91.9	3,359	4.84	892	M	
9	36.8	1,946	57.7	96.5	3,370	4.98	969	M	
10	37.3	2,016	59.8	102.2	3,370	4.86	981	M	
12	38.1	2,071	61.4	105.2	3,371	4.91	1,016	M	
13	38.5	2,021	59.9	103.4	3,371	4.80	969	M	
14	39.0	2,023	60.0	101.6	3,371	5.17	1,045	M	
16	40.3	2,079	61.7	102.6	3,371	5.37	1,117	M	
17	40.6	2,074	61.5	102.9	3,372	5.15	1,068	M	
19	41.0	2,074	61.5	102.8	3,374	5.31	1,101	M	
20	41.2	2,092	62.6	103.0	3,375	5.11	1,070	M	
22	41.4	2,079	61.6	103.0	3,376	5.16	1,072	M	
23	41.5	2,115	62.6	102.8	3,377	5.16	1,092	M	
30	41.7	2,186	64.7	102.9	3,380	.....	.....	M	1 + high
31	41.7	2,178	64.4	103.9	3,380	4.89	1,064	M	
Feb.... 2	41.6	2,162	64.0	103.9	3,380	4.98	1,077	M	
3	41.3	2,163	64.0	103.9	3,380	4.85	1,050	M	
4	40.8	2,171	64.4	103.9	3,374	4.73	1,026	M	
5	39.9	2,160	64.1	103.6	3,371	4.54	981	M	
6	38.7	2,122	63.0	102.7	3,371	4.38	930	M	
7	37.5	2,053	60.9	102.6	3,371	4.23	868	M	
9	35.1	1,940	57.7	99.4	3,364	4.06	787	M	
11	33.6	1,884	56.2	97.1	3,356	3.94	743	M	
12	33.2	1,842	54.9	96.8	3,354	3.97	730	M	
13	32.9	1,848	55.1	95.6	3,354	4.07	753	M	
14	32.7	1,841	54.9	95.5	3,354	4.17	768	M	
16	32.2	1,799	53.6	95.5	3,353	4.08	734	M	
17	32.2	1,818	54.2	95.5	3,353	4.18	759	M	
18	32.2	1,797	53.6	95.6	3,353	4.09	735	M	
20	32.2	1,810	54.0	95.7	3,353	4.19	758	M	
21	32.0	1,802	53.7	94.7	3,353	4.03	726	M	
23	30.5	1,750	52.3	93.3	3,344	3.82	669	M	
24	29.6	1,688	50.5	91.2	3,342	3.71	626	M	
27	25.4	1,522	45.7	85.0	3,331	3.35	510	M	
28	24.0	1,463	43.9	83.7	3,328	3.31	484	M	
March. 2	22.1	1,444	43.7	83.7	3,302	3.26	470	M	
3	21.8	1,445	43.8	83.2	3,301	3.17	458	M	
4	21.8	1,458	44.2	82.7	3,301	3.27	476	M	
5	21.8	1,442	43.7	84.5	3,301	3.18	459	M	
6	22.2	1,454	44.1	82.6	3,301	3.24	471	M	
7	22.6	1,469	44.5	85.5	3,302	3.34	491	M	
9	23.8	1,522	45.8	85.2	3,323	3.31	504	M	
10	24.5	1,544	46.4	87.0	3,330	3.46	534	M	
11	25.5	1,556	46.7	87.3	3,332	3.49	543	M	
12	26.7	1,588	47.6	88.1	3,337	3.58	568	M	
13	28.1	1,648	49.3	89.2	3,340	3.83	630	M	
14	29.3	1,684	50.3	91.0	3,346	3.75	631	M	
16	30.9	1,744	52.0	92.1	3,353	4.00	698	M	
17	31.4	1,746	52.0	93.3	3,355	4.11	717	M	
18	32.0	1,810	53.9	96.4	3,359	4.10	742	M	
19	32.7	1,788	53.2	92.0	3,362	4.29	767	M	
20	33.4	1,805	53.6	94.8	3,364	4.32	779	M	
21	34.0	1,849	54.9	96.5	3,367	4.19	774	M	
23	34.8	1,877	55.7	97.6	3,369	4.20	788	M	
24	34.8	1,924	57.1	97.2	3,370	4.16	801	M	
25	34.9	1,888	56.0	96.8	3,370	4.19	792	M	
26	34.8	1,893	56.2	98.9	3,370	4.23	802	M	
27	34.6	1,888	56.0	96.7	3,369	4.18	789	M	

MISSISSIPPI RIVER.—ARKANSAS CITY, ARK.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1885.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
March. 28	34.3	1,882	55.9	96.5	3,365	4.55	819	M	M = meter.
30	33.3	1,856	55.2	95.5	3,362	4.00	743	M	F = double floats
31	32.6	1,811	53.9	94.5	3,358	3 95	715	M	R = rod floats.
April 1	31.8	1,785	53.2	94.0	3,354	3.85	687	M	
2	30.8	1,739	51.9	94 0	3,350	3 84	669	M	The widths tabulated, for 1887, were scaled from the plotted cross sections, and were measured from bank to bank. There was a discharge beyond the banks which increased the water width by 320 feet, and the water area by 1,044 sq. ft; this overflow amounted to 1,666 cu. ft. per second the first two days, and subsequently to 1666 cu. ft. per second. The areas and discharges include these quantities.
3	29.9	1,680	50.1	89.5	3,351	3.90	654	M	
4	28.9	1,637	49.5	91.0	3,345	3.73	618	M	
6	27.3	1,599	47.9	86.0	3 340	3.51	562	M	
7	26.9	1,578	47.3	86.0	3,339	3 55	561	M	
8	26.8	1,576	47.2	87.0	3,343	3 54	559	M	
9	27.1	1,576	47.1	85.0	3,343	3.60	5 7	M	
1887.									
March. 22	46.6	2,331	68.0	96.0	3,414	6.12	1427	M	
23	46.6	2,337	68.1	97.0	3,414	6 20	1448	M	
24	46.6	2,474	72.1	97.0	3,416	5.98	1480	M	
25	46.6	2,409	70.1	.....	3,420	5.84	1406	M	
a. m. 26	46.6	2,343	68.2	96 0	3,420	6.08	1424	M	
p. m. 26	.....	.....	.....	.....	.....	6.02	1411	M	
1889.									
Jan.... 22	33.4	1,836	54.5	81 0	3,371	4 30	789	M	Observations of 1887 and 1889 were made by the M. R. C. 3rd district officer, and reduced at the Secretary's office.
23	34.1	1,860	55.2	83.0	3,371	4 80	894	M	
24	34 7	1,909	56.6	83.0	3,372	4 44	849	M	
28	35.2	1,914	56.7	85.0	3,373	4.71	901	M	
29	35.0	1,927	57.1	85.0	3,373	4.33	834	M	
30	34.6	1,910	56.7	85.5	3,372	4.42	845	M	
31	34.1	1,895	56.2	86 0	3,372	4.30	815	M	
Feb.... 2	33.5	1,873	55 6	84 5	3,371	4.54	851	M	
4	33 3	1,854	55.0	85.5	3,371	4.29	795	M	
6	33.5	1,798	53.3	83.0	3,372	4.41	793	M	
7	33.8	1,786	53.0	81.5	3,372	4.38	781	M	
8	33.9	1,798	53.3	83.0	3,372	4 11	738	M	Report and tabulation in Rept. C. of E. 1890, p. 3161; reprinted in Rept. 1891, p. 3489.
9	33.8	1,814	53.8	83.0	3,371	4.26	773	M	
11	33.1	1,757	52.1	82.0	3,371	4.11	721	M	
12	32.2	1,752	52.0	81 5	3,370	4.11	720	M	
14	30.0	1,679	49 5	78.0	3,368	3 72	625	M	The section at same place as in 1884-5; about ½ mile below Arkansas City.
16	26.8	1,427	42.7	68 5	3,341	3.58	510	M	
19	22.7	1,290	38.8	63.0	3,321	3.22	416	M	
20	21.5	1,253	38.0	66.0	3,296	3.24	406	M	
21	20.6	1,232	38.1	65.0	3,285	3.23	405	M	
22	20.2	1,239	37.7	65.5	3,284	3.21	398	M	The gauge readings are all referred to the Mississipi River Commission gauge at Arkansas City, whose zero is 116.44' above the Cairo datum plane.
23	21.0	1,276	38 8	66.0	3,285	3.40	434	M	
25	25.5	1,435	43.1	69.0	3,327	3.71	532	M	
26	27.6	1,481	44.3	73.5	3,346	3 96	587	M	
27	29.2	1,563	46.6	73.5	3,353	3.90	689	M	
28	30.7	1,601	47 7	74.0	3,359	3.97	635	M	
March. 2	32.8	1,683	49.9	77.5	3,372	4.15	699	M	
4	33.8	1,676	49.6	78 0	3,376	4.41	739	M	
5	34.1	1,684	49.9	77.5	3,376	4.21	710	M	
6	34.5	1,721	51.0	78.5	3,376	4.34	748	M	
7	34.9	1,728	51.2	78.5	3,376	4 34	750	M	
8	35.0	1,722	51.0	78.0	3,377	4.33	745	M	
9	35.0	1,738	51.5	78.0	3,377	4 19	728	M	
11	34.6	1,750	51.8	79.0	3,377	4.18	731	M	
12	34.2	1,745	51.7	81.0	3,376	4.12	719	M	
13	33.6	1,715	50.8	77.0	3,375	4.07	698	M	
14	32,9	1,682	49.9	74 5	3,374	4.04	679	M	
15	32.1	1,608	49.5	77.5	3,370	4.00	668	M	
16	31.3	1,628	48.4	76 5	3,363	3.90	634	M	
19	29.0	1,549	46.2	73.5	3,352	3.77	585	M	
20	28.6	1,518	45.4	73.5	3,344	3.69	561	M	
21	28.0	1,505	45 1	73.0	3,339	3.72	560	M	
22	27.5	1,478	44.3	71.5	3,337	3.62	535	M	
23	26.9	1,474	44.2	72.0	3,335	3.56	524	M	
25	26.2	1,450	43.5	70.5	3,334	3.57	518	M	
26	26.2	1,449	43.5	70.5	3,331	3.51	508	M	
27	27.1	1,477	44 3	71.0	3,336	3 72	549	M	
28	28.4	1,524	45.6	72.0	3,344	3.90	594	M	
29	30.2	1,577	47 0	74 0	3,355	3.98	627	M	
30	31.2	1,606	47.8	74 0	3,363	4 00	642	M	

Mississippi River.—Arkansas City, Ark.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n, in 100 sq ft.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	DISCHARGE PER SECOND IN 1000 CUBIC FEET. River.	Bank.	Total.	Method.	Remarks.
1889.	feet.		feet.	feet.	feet.	feet.					
April.. 1	32.1	1,633	48 5	75.0	3,370	4.06	662	.....	.....	M	
2	32.1	1,641	48.7	75.0	3,370	4.00	656	.....	.....	M	
4	31.8	1,647	48.9	75 0	3,368	3.99	657	.....	.....	M	
5	31.4	1,617	48 1	73.5	3,364	3.87	626	.....	.....	M	
6	30.9	1,609	47 9	73.0	3,358	3.84	618	.....	.....	M	
8	29.9	1,565	46.7	72 5	3,354	3.73	584	.....	.....	M	
9	29.4	1,593	47.5	74 5	3,352	3.70	590	.....	.....	M	
10	29.2	1,576	46.4	73.5	3,352	3.68	573	.....	.....	M	
11	28.9	1,539	45.9	73.5	3,352	3.74	575	.....	.....	M	
12	28.6	1,524	45.6	72.5	3,344	3.79	577	.....	.....	M	
13	28.1	1,506	45 1	72.5	3,340	3.62	546	.....	.....	M	
15	27.1	1,469	44 0	72.0	3,336	3.53	519	.....	.....	M	
16	26 6	1,449	43.5	70.0	3,335	3.52	510	.....	.....	M	
17	26.0	1,430	42.9	69.5	3,333	3.43	491	.....	.....	M	
18	25.4	1,403	42 1	68.5	3,332	3.41	479	.....	.....	M	
19	25.0	1,380	41.4	69.0	3,329	3.31	457	.....	.....	M	
20	24.6	1,352	40.6	68.5	3,327	3.30	446	.....	.....	M	
22	24.3	1,345	40.4	67.0	3,326	3.31	445	.....	.....	M	
23	24 5	1,339	40 2	66.5	3,327	3.40	455	.....	.....	M	
24	24.8	1,357	40 8	67 0	3,329	3.45	468	.....	.....	M	
25	25.2	1,365	41.0	67.0	3,330	3.48	475	.....	.....	M	
26	25.6	1,365	41.0	67.0	3,332	3.49	476	.....	.....	M	
27	26 4	1,392	41.7	69.0	3,334	3.60	500	.....	.....	M	
29	27.9	1,443	43.2	71 0	3,339	3.64	525	.....	.....	M	
May.... 1	27.9	1,458	43.5	71.5	3,339	3.59	521	.....	.....	M	
1890.											
March. 14	48.2	2,066	60.4	83.0	3,420	5.71	1,181	5	1,186	M	
19	48.8	2,226	65.1	88.5	3,420	6.34	1,410	8	1,418	M	
25	49.2	2,276	66.0	89 5	3,420	5.56	1,210	10	1,220	M	
26	49.4	2,283	66.8	86 0	3,420	5.68	1,298	10	1,308	M	
28	49.2	2,188	64 0	89.0	3,420	5.54	1,213	10	1,223	M	
30	48.8	2,314	67.7	92.0	3,420	5.37	1,242	8	1,250	M	
31	48.8	2,277	66.6	92 0	3,420	5.55	1.264	8	1,272	M	
April.. 2	48.6	2,301	67.3	89 0	3,420	5.79	1,332	7	1,339	M	
4	48.3	2,267	66 3	89.0	3,420	5.36	1,216	5	1,221	M	
7	47.9	2,282	65.3	89.0	3,420	5.30	1,183	4	1,187	M	
9	48.0	2,263	66.2	89.5	3,420	5.37	1,216	4	1,220	M	
11	47.9	2,335	68.3	88 0	3,420	5.12	1,196	4	1,199	M	
13	47.8	2,415	70 6	89.0	3,420	5.51	1,332	3	1,335	M	
15	47.8	2,374	69.4	91.0	3,420	5.40	1,281	3	1,284	M	
1891.											
March. 6	45.0	2,114	61.7	86.0	3,427	6.04	1,278	.....	1,278	M	
7	45.3	2,089	61.3	85.0	3,427	5.98	1,255	.....	1,255	M	
8	45.6	2,045	59.7	84.0	3,427	5.60	1,144	.....	1,144	M	
9	45.6	2,061	60 1	86.0	3,427	6.06	1,248	2	1,250	M	
10	45.8	2,124	62.0	88.0	3,427	6.05	1,285	2	1,287	M	
11	46.1	2,116	61 8	82.5	3,427	5.71	1,209	3	1,212	M	
12	46.4	2,208	64.4	87.0	3,427	5.22	1,153	3	1,156	M	
13	46.5	2,177	63.5	87.2	3,427	5.34	1,162	3	1,165	M	
14	46.6	2,181	62.2	86.2	3,427	5.87	1,144	4	1,148	M	
16	46.9	2,196	64.1	88.5	3,427	5.49	1,205	4	1,209	M	
17	46.9	2,210	64.5	88.5	3,427	5.50	1,215	4	1,219	M	
18	47.0	2,216	64.7	87.5	3,427	5.36	1,189	4	1,193	M	
19	47.1	2,171	63.3	86.0	3,427	5.33	1,157	4	1,162	M	
20	47.3	2,195	64.0	87.2	3,427	5.36	1,177	5	1,182	M	
21	47.3	2,239	65.3	88.2	3,427	5.40	1,209	5	1,214	M	
22	47.4	2,295	67.0	89.0	3,427	5.36	1,229	5	1,234	M	
23	47.5	2,293	66.9	90.0	3,427	5.26	1,206	5	1,211	M	
24	47.6	2,282	66.6	89.8	3,427	5.47	1,248	5	1,253	M	
28	47.8	2,319	67.7	88.6	3,427	5.97	1,384	7	1,391	M	
30	47.9	2,357	68.8	92.0	3,427	5.99	1,412	7	1,419	M	
31	48.0	2,384	69.6	93.0	3,427	5.94	1,417	7	1,424	M	
April.. 1	48.1	2,363	68.9	93.0	3,427	5.93	1,401	8	1,409	M	
3	48.2	2,389	69.7	93.0	3,427	5.91	1,411	8	1,419	M	
4	48.2	2,371	69.2	92.0	3,427	5 90	1,398	8	1,406	M	
6	48.2	2,391	69.8	92 0	3,427	5.85	1,399	8	1,407	M	

M = meter.
F = double floats.
R = rod floats.

For notes see p. 69.

MISSISSIPPI RIVER.—ARKANSAS CITY, ARK.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n, in 100 sq. ft.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	DISCHARGE PER SECOND IN 1000 CUBIC FEET. River.	Bank.	Total.	Method.	REMARKS.
1891.	feet.		feet.	feet.	feet.	feet.					
April.. 7	48.2	2,398	70.0	94.0	3,427	5.91	1,417	8	1,425	M	
8	48.1	2,359	68 8	91.0	3,427	5.89	1,390	8	1,398	M	
9	48.0	2,334	68.1	90.0	3,427	6.00	1,400	7	1,407	M	
10	47.9	2,336	68.2	92.0	3,427	5.81	1,356	7	1,363	M	
11	47.8	2,341	68.3	93.0	3,427	5.71	1,336	6	1,342	M	
13	47.6	2,308	67.3	92.0	3,427	5.60	1,293	5	1,298	M	
14	47.5	2,351	68.6	92.0	3,427	5.67	1,334	5	1,339	M	
15	47.4	2,342	68.3	91.0	3,427	5.54	1,298	5	1,303	M	
16	47.3	2,348	68.5	91.0	3,427	5.59	1,313	4	1,317	M	
18	47.2	2,334	68.1	91.0	3,427	5.52	1,288	4	1,292	M	
20	47.2	2,321	67.7	91.0	3,427	5.45	1,265	4	1,269	M	
21	47.2	2,323	67.8	91.0	3,427	5.53	1,285	4	1,289	M	
22	47.1	2,312	67.5	91.0	3,427	5.48	1,266	4	1,270	M	
23	47.1	2,312	67.5	91.0	3,427	5.53	1,279	4	1,283	M	
24	47.2	2,329	68.0	91.0	3,427	5.29	1,233	4	1,237	M	
25	47.3	2,312	67.5	90.0	3,427	5.29	1,224	4	1,228	M	
27	47.5	2,292	66.0	89.0	3,427	5.41	1,224	4	1,228	M	
28	47.4	2,277	66.4	90.0	3,427	5.46	1,243	4	1,247	M	
29	47.3	2,261	66.0	89.0	3,427	5.30	1,197	4	1,201	M	
30	47.1	2,262	66.0	89.0	3,427	5.24	1,185	4	1,189	M	
May... 2	46.5	2,237	65.3	89.0	3,427	5.29	1,183	3	1,186	M	
4	45.6	2,257	65.9	87.0	3,427	5.02	1,134	2	1,136	M	
6	43.9	2,142	62.5	87.0	3,427	4.77	1,022	1	1,023	M	
7	43.0	2,107	61.6	83.0	3,421	4.68	986	.....	986	M	
8	41.7	2,066	60.5	82.0	3,416	4.54	937	.....	937	M	
9	40.5	2,024	59.3	81.0	3,411	4.32	874	.....	874	M	
11	38.2	1,939	56.9	79.0	3,406	4.22	818	.....	818	M	
12	37.0	1,900	55.9	77.0	3,399	4.19	796	.....	796	M	
1892.											
April. 22	46.0	2,253	65.2	88.0	3,453	5.81	1,308	2	1,311	M	‖ Observations doubtful.
23	46.4	2,411	69.8	91.0	3,453	6.00	1,447	3	1,450	M	
25	46.9	2,398	69.5	93.0	3,453	5.76	1,382	3	1,385	M	
26	47.1	2,470	71.5	93.0	3,455	6.16	1,522	4	1,526	M	
27	47.2	2,464	71.3	95.0	3,455	6.47	1,593	4	1,597	M	
28	47.4	2,489	71.9	95.0	3,461	6.11	1,520	4	1,525	M	
29	47.6	2,516	72.7	95.0	3,461	6.13	1,542	5	1,547	M	
30	47.8	2,529	73.1	95.0	3,461	6.26	1 582	5	1,587	M	
May.... 2	48.0	2,466	71.2	95.0	3,461	6 56	1,619	6	1,625	M	
3	48 0	2,476	71.5	94.0	3,461	6.17	1,526	6	1,533	M	
¶4	48.1	2,464	71.2	95.0	3,461	7.01	1,727	7	1,734	M	
□4	48.1	.....	.....	.....	.....	7.04	1,735	7	1,742	M	
5	48.2	2,487	71.9	93.0	3,461	6.36	1,582	7	1,589	M	
6	48.3	2,477	71.6	95.0	3,461	6.62	1,641	7	1,648	M	
7	48.6	2,472	71.4	95.0	3,461	6.50	1,607	7	1,614	M	
9	48.8	2,496	72 1	95.0	3,461	6.62	1,653	7	1,660	M	
10	48.8	2,472	71.4	94.9	3,461	6.45	1,594	7	1.601	M	
11	48.9	2,487	71.8	95.5	3,461	6.28	1,486	8	1,493	M	
12	49.0	2,498	72.2	94.5	3,461	6.20	1,548	8	1,556	M	
13	49.1	2,482	71.7	95.5	3,461	5.88	1,459	8	1,467	M	
14	49.1	2,433	70.3	95.0	3,461	5.76	1,402	8	1,410	M	
16	49.1	2,509	72.5	96.0	3,461	5.76	1,444	8	1,452	F	
19	49.2	2,514	72.6	95.5	3,461	5 79	1,457	8	1,465	M	
21	49.3	2,476	71.5	90.0	3,461	5.65	1,398	8	1,406	M	
25	49.4	2,510	72.5	96.0	3,461	5.68	1,427	8	1,435	M	
23	49.4	.....	.....	.....	.....	5.84	1,466	8	1,475	F	
24	49.5	2,480	71.6	95.5	3,461	5.71	1,415	8	1,424	M	
26	49.6	2,519	72.8	97.0	3,461	5.70	1,436	9	1,445	M	
27	49.6	2,509	72.5	96.0	3,461	5 66	1,420	9	1,429	M	
28	49.7	2,509	72.5	96.0	3,461	5.73	1,437	9	1 446	M	
30	49.8	2,497	72.1	96.0	3,461	5 74	1,432	9	1,441	M	
31	49.8	2,483	71.8	94.5	3,461	5.94	1,477	9	1,485	M	
June... 1	49 9	2,513	72.6	95 5	3,461	5.88	1,477	9	1,485	M	
3	49.7	2,466	71.3	94.0	3,461	5 95	1,468	9	1,477	M	
4	49 6	2,458	71.0	92 0	3,461	5.87	1,444	9	1,452	M	
6	49.5	2,435	70.3	91.0	3,461	5.78	1,407	8	1,416	M	
7	49.4	2,515	72.7	96.0	3,461	5.79	1,455	8	1,463	M	

M = meter.
F = double floats.
R = rod floats.

¶ a. m. □ p. m.

For notes see p. 69.

Mississippi River.—Arkansas City, Ark.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n, in 100 sq ft.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	DISCHARGE PER SECOND IN 1000 CUBIC FEET. River.	Bank.	Total.	Method.	REMARKS.
1892.	feet.		feet.	feet.	feet.	feet.					
June... 8	49 4	2,518	72.7	95.0	3,461	5.78	1,456	8	1,465	M	
9	49 4	2,548	73.6	96.0	3,461	5.79	1,475	8	1,484	M	
10	49.4	2,530	73.1	94.0	3,461	5.82	1,473	8	1,481	M	
11	49 4	2,533	73.2	95.5	3,461	5.74	1,454	8	1,462	M	
13	49.4	2,484	71.8	94 0	3,461	5.81	1,443	8	1,451	M	
14	49 4	2,453	70.9	93 0	3,461	5.86	1,438	8	1,446	M	
14	49.4	a2,420	69.9	93.0	3,461	5.85	1,415	8	1,423	M	
15	49.4	2,472	71.4	93.6	3,461	5.66	1,400	8	1,408	M	
16	49.4	2,506	72.4	93.5	3,461	5.78	1,449	8	1,457	M	
17	49 3	2,494	72.1	95.0	3,461	5.73	1,428	8	1,436	M	
19	49 2	2 481	71.7	94.0	3,461	5.70	1,415	8	1,422	M	
20	49.0	2,493	72.0	93.0	3,461	5.60	1,397	7	1,404	M	
20	49 0	.....	.....	.....	.....	5.59	1,394	7	1,401	F	
21	48.8	2,472	71.4	92.5	3,461	5.62	1,388	7	1,395	M	
21	48.8	a 2,404	69.5	90.0	3,461	5.61	1,848	7	1,356	M	
23	48.5	2,456	71.0	94.0	3,461	5.45	1,388	7	1,344	M	
24	48.3	2,463	71.2	92.5	3,461	5.50	1,354	6	1,360	M	
27	47.5	2,403	69.4	90.0	3,461	4.98	1,196	4	1,201	M	
28	47.2	2,449	70.8	92 0	3,461	4.80	1,175	4	1,179	M	
29	46.6	2,440	70.5	92.0	3,461	4.82	1,177	3	1,180	M	
30	46.1	2,366	68.5	89.0	3,453	5.02	1,189	3	1,192	M	
30	46.1	.....	.....	.....	.....	4.99	1,182	3	1,184	F	
July....1	45.5	2,399	69.5	89.0	3,453	4.82	1,156	2	1,158	M	
1	45 5	.....	.....	.....	.....	4.75	1,140	2	1,142	F	
June...28	46.9	2,226	54 9	68 5	4,054	5.80	1,292	6	1,298	M	Chicot City section, seven miles above Arkansas City.
29	46.6	2,247	55.4	70.0	4,054	5.59	1,257	6	1,262	M	
¶30	46.1	2,177	53.7	68.0	4,054	4.78	1,040	6	1,046	M	
□30	46 0	.....	.....	.....	.....	4.87	1,059	6	1,065	M	
July....1	45.4	2,195	54.1	68.0	4,054	4.65	1,020	6	1,025	M	
1	45.3	.....	.....	.....	.....	4.88	1,071	6	1,077	F	
2	44.6	2,100	51.8	66.5	4,054	5.26	1,104	6	1,110	M	
2	44.6	.....	.....	.....	.....	4.89	1,027	6	1,033	M	
1893.											
March..9	43.1	2,220	64.5	95.5	3,441	4.75	1,054	.....	.....	M	
9	.....	.....	.....	.....	.....	4.83	†1,072	.....	.....	M	
10	43.2	2,182	63.4	95.5	3,441	4.75	1,036	.....	.....	M	
10	.....	.....	.....	.....	.....	4.83	†1,054	.....	.....	M	
11	43.2	2,247	65.3	96.0	3,441	4.49	1,009	.....	.....	M	
11	.....	.....	.....	.....	.....	4.57	†1,026	.....	.....	M	
13	43.0	2,217	64.4	96.5	3,441	4.99	1,106	.....	.....	M	
18	40.7	2,127	61.9	91.5	3,436	4.74	1,007	.....	.....	M	
20	40.2	2,018	58.8	92.5	3,434	4 62	931	.....	.....	M	
21	40.0	2,043	59.5	95.5	3,433	4.70	960	.....	.....	M	
21	.....	.....	.....	.....	.....	4.58	935	.....	.....	*M	
22	39.9	2,064	60.2	92.0	3,431	4 76	983	.....	.....	M	
24	39.9	2,053	59.8	89.5	3,431	4.53	939	.....	.....	M	
25	40.0	2,053	59 9	92.0	3,429	4 61	946	.....	.....	M	
25	.....	.....	.....	.....	.....	4.46	916	.....	.....	*M	
27	40.0	2,008	58.6	90.0	3,429	4.63	931	.....	.....	M	
27	.....	.....	.....	.....	.....	4.64	932	.....	.....	*M	
29	39.9	2,006	58.5	92.0	3,429	4.54	911	.....	.....	M	
29	.....	2,053	46 2	70.0	4,440	4.49	921	.....	.....	M	Upper section.
30	39.6	2,030	45.8	69 0	4,437	4.57	928	.....	.....	M	
30	.....	2,024	59.1	91.0	3,425	4.59	928	.....	.....	M	
31	39.4	2,056	60.0	90.0	3,424	4.41	907	.....	.....	M	
April.. 1	39.0	1,986	58.0	89 0	3,423	4.34	863	.....	.....	M	
1	.....	.....	.....	.....	.....	4.36	866	.....	.....	*M	
3	38.0	1,954	57.1	86.5	3 421	4.28	836	.....	.....	M	
3	.....	.....	.....	.....	.....	4.23	827	.....	.....	*M	
4	37.4	1,921	56.2	84.5	3,418	4.27	821	.....	.....	M	
4	.....	.....	.....	.....	.....	4.24	814	.....	.....	*M	
4	.....	.....	.....	.....	.....	4.27	820	.....	.....	F	
5	36.6	1,933	56.5	85.0	3,418	4.09	791	.....	.....	M	
5	.....	.....	.....	.....	.....	4 19	809	.....	.....	*M	

¶ a. m. □ p. m.
a Piano wire soundings.
† As observed at ⅗ depth.

M = meter.
F = double floats.
* M = meter moving across stream or flanking.

For notes see p. 69.

MISSISSIPPI RIVER.—ARKANSAS CITY, ARK.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n, in 100 sq. ft.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	DISCHARGE PER SECOND IN 1000 CUBIC FEET. River.	Bank.	Total.	Method.	REMARKS.
1898.	feet.		feet.	feet.	feet.	feet.					
April.. 6	35.8	1,868	54.8	84 0	3,412	4.08	763	.....	.....	M	
6	.....	.....	.....	.....	.....	4.06	758	.....	.....	*M	
7	35.0	1,818	53.4	83.0	3,407	4.06	738	.....	.....	M	
7	.....	.....	.....	.....	.....	3.97	721	.....	.....	*M	
8	34.2	1,797	52.8	81.5	3,403	3.96	711	.....	.....	M	
8	.....	.....	.....	.....	.....	3.96	711	.....	.....	*M	
May... 5	46.2	2,307	66.8	96 5	3,455	5.18	1,196	3	1,198	M	
6	46.8	2,389	69.2	99.0	3,455	5.19	1,239	3	1,243	M	
8	48.1	2,463	71.8	101.5	3,455	5.37	1,323	6	1,329	M	
8	.....	.....	.....	.....	.....	5.39	1,327	.....	.....	*M	
9	48.4	2,492	72.1	102.0	3,455	5.48	1,367	6	1,372	M	
9	.....	.....	.....	.....	.....	5.41	1,349	.....	.....	*M	
10	48.8	2,496	72 3	102.5	3,455	5.50	1,374	6	1,380	M	
10	.....	.....	.....	.....	.....	5.52	1,378	.....	.....	*M	
11	49.0	2,526	73.1	104.0	3,455	5.54	1,400	6	1,406	M	
11	.....	.....	.....	.....	.....	5 50	1,390	.....	.....	*M	
12	49.1	2,516	72.8	104.5	3,455	5.57	1,401	6	1,407	M	
12	.....	.....	.....	.....	.....	5.57	1,400	.....	.....	*M	
13	49.2	2,576	74 5	104.5	3,455	5.52	1,422	6	1,428	M	
13	.....	.....	.....	.....	.....	5.47	1 408	.....	.....	*M	
15	49.6	2,570	74.4	103.0	3,455	5 63	1,446	7	1,453	M	
15	.....	.....	.....	.....	.....	5.51	1,416	.....	.....	*M	
16	49.6	2,543	73.6	102.0	3,455	5.59	1,421	7	1,428	M	
17	49.6	2,503	72.4	104.0	3,455	5.60	1,403	8	1.411	M	
17	.....	.....	.....	.....	.....	5.53	1,384	.....	.....	*M	
18	49.6	2,540	73.5	105.5	3,455	5.68	1,443	8	1,451	M	
18	.....	.....	.....	.....	.....	5.62	1,429	.....	.....	*M	
19	49.6	2,554	73.9	102.5	3,455	5.60	1,430	8	1,438	M	
19	.....	.....	.....	.....	.....	5.70	†1,455	.....	.....	M	
19	.....	.....	.....	.....	.....	5.76	1,472	.....	.....	*M	
20	49.6	2,549	73.8	104.5	3,455	5 62	1,433	8	1,442	M	
20	.....	.....	.....	.....	.....	5.60	1,426	.....	.....	*M	
22	49.6	2,482	71.9	103 0	3,455	5.64	1,400	8	1,409	M	
22	.....	.....	.....	.....	.....	5 97	1,482	.....	.....	*M	
23	49.7	2,529	73.2	102.0	3,455	5.64	1,426	8	1,434	M	
23	.....	.....	.....	.....	.....	5.62	1,421	.....	.....	*M	
24	49.8	2,584	74.8	102.0	3,455	5.66	1,463	8	1,471	M	
24	.....	.....	.....	.....	.....	5.54	†1,432	.....	.....	M	
24	.....	.....	.....	.....	.....	5.45	‡1,408	.....	.....	M	
25	50.0	2,559	74.1	102 0	3,455	5.60	1,432	8	1.440	M	
25	.....	.....	.....	.....	.....	5 69	1,455	.....	.....	*M	
26	50.0	2,608	75.5	104.0	3,455	5.40	1,408	9	1,417	M	
26	.....	.....	.....	.....	.....	5.70	1,486	.....	.....	*M	
27	50.0	2,610	75.5	104.0	3.455	6.39	1,667	9	1,676	M	
27	.....	.....	.....	.....	.....	6.00	1,566	.....	.....	*M	
b 29	50.2	2,592	75.0	103.5	3,455	5.90	1,528	9	1,538	M	
29	.....	.....	.....	.....	.....	5.95	1,542	.....	.....	*M	
31	49.8	2,585	74.8	104.0	3,455	5.79	1,496	8	1,504	M	
June... 1	49.6	2,570	74.4	103.0	3,455	5.82	1,495	8	1,503	M	
1	.....	.....	.....	.....	.....	5.71	1,408	.....	.....	*M	
2	49.6	2,596	75.1	105.5	3,455	5 73	1,489	8	1,496	M	
2	.....	.....	.....	.....	.....	5.81	1,508	.....	.....	*M	
3	49.6	2,591	75.0	104.5	3,455	5.70	1,476	8	1,483	M	
3	.....	.....	.....	.....	.....	5.73	1,486	.....	.....	*M	
5	49.6	2,579	74.6	104.0	3,455	5 67	1,462	7	1,469	M	
5	.....	.....	.....	.....	.....	5.74	1,480	.....	.....	*M	
7	49.5	2,567	74.3	103.5	3,455	5.63	1,446	7	1,453	M	
7	.....	.....	.....	.....	.....	5 58	1,433	.....	.....	*M	

M = meter.
* M = Meter moving across stream or flanking.

For notes see p. 69.

† As observed at $\frac{8}{10}$ depth.

§ Observed.

‡ Observed at $\frac{8}{10}$ depth and reduced by vertical factor.

b Cypress Creek crevasse occurred at 4 a. m.

Mississippi River.—Arkansas City, Ark.—*Continued.*

Section of 1890 is same as in 1889; Observations and reduction by 3rd district officer, M. R. C. Tabulation in Rept. C. of E. 1891, p. 3537.

Section of 1891 and 1892 is same as in 1889 and 1890, except that the Mississippi end is moved downstream 100 feet.

Report and tabulation for 1891 in Rept. C. of E., 1892, pp. 3123 and 3132, respectively; for 1892, Report C. of E. 1893, pp. 3665, 3677 and 3686 respectively.

May 28 and 29, 1892, the overflow discharge between Arkansas City and Trippe was found to be 309,000; May 30 and 31 it was 261,000. Report C. of E. 1893, p. 3701.

Observations of 1891-3 made by 3rd district officer, M R. C., and reduced at Secretary's office.

Discharges for 1893 observed at different proportional depths, are all reduced to mean of vertical, unless otherwise noted.

Section of 1893 was downstream from section used for several years past. The Arkansas end was 200 feet and Mississippi end 560 feet below former position, its azimuth being changed 6° 40′

Report on work, Report C. of E., 1894, p. 2822. Tabulation, ibid., p. 2828.

Mississippi River.—Greenville, Miss.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1894.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
April..19 a. m. *	28.1	1387	39.2	94.0	3538	5.27	¶740	M	M = meter.
April..19 p. m. ‡	28.2	1779	34.0	68.5	5232	3.77	671	M	
Nov..20†	— 0.5	363	13.1	21.5	2754	2.86	104	M	

Notes.—The gauge readings are from the M. R. C gauge at Greenville, whose zero is 108.0′ above the Cairo datum plane.

The meter was run at six-tenths depth; velocities used as observed at that depth. Observations and reduction by 3rd district officer, M. R. C.

* Section 1 mile above Barnes Landing and about 2½ miles above Greenville, Miss. Greenville is 478.3 miles below Cairo. 12 velocity stations 300 feet apart, and 52 soundings.

¶ Of this total 9604 cu. ft. is chute discharge; the area, depths, velocity and width include the main river only.

‡ Section at Warfield Point about 5 miles below Greenville, Miss. 18 velocity stations 300 ft apart and 72 soundings.

† Section above Warfield Towhead and about 3 miles below Greenville, Miss. 14 velocity stations 200 feet apart, and 55 soundings.

Louisiana Bend, La.

1891. Oct.....19	1.4	674	42.5	77	? 1585	1.96	132	M	

Velocities observed with the Price current meter at six-tenths depth.

Louisiana Bend is about 522 miles below Cairo and about 9 miles above Wilson Point, La.

Lake Providence gauge reading is given, zero 89.62 feet above the Cairo datum plane.

Report C. of E., 1892, p. 3135.

Mississippi River.—Wilson Point, La.

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1883.	feet.	100 sq.ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Nov....28	19.2	1,145	33 9	88.0	3,383	4.29	491	M	M — meter.
Dec....10	25.1	1,319	39.0	85.0	3,383	4.89	645	M	
1884.									‡ These observations were taken in fog and rain with the river full of drift. Meter worked very badly.
Jan..‡ 31	25.9	1,299	37.9	75.0	3,425	5.03	658	M	
Feb....15	34.6	1,603	46.2	86.0	3,467	5.40	865	M	
26	37.4	1,763	50.8	88.0	3,472	5.85	1,031	M	
27	37.5	1,725	49.8	86.0	3,472	6.13	1,059	M	
28	37.5	1,729	49.8	88.0	3,472	5.88	1,016	M	
29	37.6	1,786	51.4	91.5	3,472	5.80	1,036	M	Tabulated results 1883 to May, 1890, inclusive, Report C. of E. 1890, p. 3173. Report on reduction, ibid. p. 3170.
March 3	37.6	1,753	50.3	88.0	3,484	5.82	1,021	M	
6	37.8	1,803	51.8	88.0	3,484	5.78	1,042	M	
11	38.0	1,860	53.4	90.0	3,484	6.10	1,134	M	
13	38.0	1,880	52.5	89.0	3,484	6.08	1,108	M	
17	37.8	1,846	53.0	87.0	3,484	5.82	1,076	M	
19	37.8	1,847	53.0	89.0	3,484	5.66	1,045	M	The discharge section was located at about the same place until 1894, when it was moved up opposite Skipwith Towhead.
21	37.9	1,869	53.7	89.0	3,484	5.87	1,004	M	
24	38.0	1,881	54.0	89.0	3,484	5.57	1,048	M	
26	37.8	1,862	53.5	86.5	3,484	5.43	1,012	M	
28	37.7	1,856	53.3	86.0	3,484	5.33	989	M	
April.. 5	37.0	1,883	54.0	85.0	3,484	5.42	1,019	M	All observations by 3rd district officer, M. R. C., and reduction made at Secretary's except for 1894, which was made at district office.
12	36.7	1,882	54.0	85.5	3,484	5.32	1,001	M	
16	36.9	1,854	53.2	85.0	3,484	5.51	1,022	M	
24	36.8	1,889	54.2	88.0	3,484	5.37	1,015	M	
May....3	36 6	1,907	54.7	88.0	3,484	5.31	1,012	M	The gauge readings tabulated herewith are those of the Wilson Point gauge, whose zero is 93.45 ft above the Cairo datum plane.
10	36.7	1,829	52.5	86.0	3,484	5.29	968	M	
16	36.5	1,865	53.5	85 5	3,484	5.31	991	M	
27	34.6	1,829	52.5	85.0	3,482	4 87	891	M	
June...11	25.2	1,480	42.4	75.0	3,488	3.95	584	M	
17	25.6	1,477	42.3	74.0	3,495	4.18	617	M	
23	26.3	1,533	43.6	75.0	3,520	4.02	617	M	
28	25.4	1,472	41.8	73.5	3,517	4.12	606	M	
July... 7	22.8	1,353	38.9	69.5	3,478	4.04	547	M	
22	20.4	1,333	38.4	70.0	3,475	3.94	525	M	
Aug....14	16.5	1,152	33.1	66.0	3,482	3.21	370	M	
Sept....17	8.6	995	26.1	58.0	3,467	2.80	258	M	
Oct.....21	15.3	1,155	33 5	67.5	3,444	3.28	378	M	
Nov....25	7.8	896	26.1	62.0	3,440	2.74	246	M	
1885.									† These observations taken under unfavorable circumstances and amid much floating drift.
Jan...† 3	21.7	1,283	35.5	72.0	3,478	3 88	478	M	
8	29.1	1,566	44.9	75.0	3,485	5.00	784	M	
13	31.2	1,695	48.4	79.5	3,502	5.75	975	M	
21	33.8	1,748	49.9	78.5	3,504	5.23	915	M	
26	34.3	1,767	50.4	79.0	3,504	{6.33 / 6.70	¶1,118 / ‖1,183	M / M	‡ a. m. ‖ p. m.
29	34.5	1,779	50.8	79.0	3,504	5.38	958	M	
Feb ... 6	33.6	1,822	52.0	79.0	3,505	5.12	932	M	
14	28.3	1,571	44.8	72.0	3,503	4.37	686	M	
19	27.2	1,606	45.9	71.0	3,502	4.23	695	M	
25	24.9	1,509	43.2	68.0	3,500	4.04	610	M	
March. 5	18.2	1,237	35 7	62.0	3,469	3.52	436	M	
13	21.59	1,382	39.7	66.0	3,488	3.97	548	M	
1887.									
April..19	23.4	1,393	39.3	60.0	3,545	3.89	542	M	
1888.									
April..22	37.8	1,798	50 7	72.0	3,550	6.45	1,160	M	
23	37.8	1,779	50.1	71.0	3,550	6.39	1,137	M	
24	37.8	1,747	49.1	69.0	3,555	6.04	1,054	M	
25	37.8	1,814	51.0	73.0	3,555	6 00	1,088	M	
26	37.7	1,881	53.0	72.0	3,550	6.37	1,199	M	
27	37.6	1,793	50.6	73.0	3,542	6.25	1,120	M	
1889.									
July....3	29.2	1,337	36.9	75.0	3,626	6 39	854	M	
4	28.9	1,325	36 5	76.5	3,626	6.49	860	M	
5	28.3	1,294	35.7	76.5	3,624	6.12	791	M	

MISSISSIPPI RIVER.—WILSON POINT, LA.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n, in 100 sq. ft.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	DISCHARGE PER SECOND IN 1000 CUBIC FEET. River.	Bank.	Total.	Method.	REMARKS.
1890.	feet.		feet.	feet.	feet.	feet.					
Jan....28	34.9	1,477	39.4	78.0	3,744	7.39	1,091	.....	1,091	M	
31	36.0	1,530	40 9	79.0	3,744	6.97	1,067	.....	1,067	M	
Feb.... 3	37.0	1.538	41.1	80 0	3,744	7 50	1.153	.....	1,153	M	
4	37.2	1,658	44 3	82.0	3,744	7.03	1,165	.....	1,165	M	
5	37 4	1,592	42 5	81.0	3,744	6.87	1,094	5	1,099	M	
6	37.6	1,638	43.7	82.0	3,744	6.85	1,121	8	1,129	M	
8	38.1	1,716	45.8	.....	3,744	6.87	1,179	16	1,195	M	
10	38.4	1,789	47.8	81.0	3,744	6.83	1,222	20	1,242	M	
11	38.4	1,752	46.8	81.0	3,744	6.70	1,173	23	1,196	M	
12	38.4	1,733	46.3	80.0	3,744	6.40	1,110	23	1,133	M	
13	38.4	1,741	46.5	80.0	3,744	6.32	1,100	23	1,123	M	
14	38.6	1,774	47.4	80.0	3,744	6.38	1,123	25	1,148	M	
15	38.6	1,716	45.8	80.0	3,744	6.19	1,062	25	1,087	M	
17	38.6	1,755	46.9	80.0	3,744	6.14	1,077	26	1,103	M	
20	39.0	1,777	47.5	80.0	3,744	5.98	1,063	28	1,091	M	
21	39.0	1,800	48.1	80.0	3,744	6.33	1,139	28	1,167	M	
22	39.2	1,823	48.7	80.0	3,744	6.01	1,096	29	1,125	M	
24	39.4	1,789	47.8	81.0	3,744	6.22	1,113	30	1,143	M	
25	39.4	1,814	48.4	80.0	3,744	6.11	1,108	30	1,138	M	
26	39.4	1,801	48.1	80.0	3,744	5.97	1,075	30	1,105	M	
27	39.6	1,837	49.1	80.0	3,744	5.79	1,063	31	1,094	M	
March..1	39.4	1,798	48.0	80.0	3,744	5.80	1,043	30	1,073	M	
3	39.4	1,836	49.0	80.0	3,744	5.91	1,085	30	1,115	M	
4	39.5	1,849	49.4	81.0	3,744	5.77	1,067	31	1,098	M	
5	39.6	1,857	49.6	80.0	3,744	5.94	1,103	33	1,136	M	
6	39.7	1,907	50.9	80.0	3,744	6.01	1,145	34	1,179	M	
7	40.0	1,930	51.6	81.0	3,744	5.81	1,122	40	1,162	M	
8	40.1	1,957	52.3	81.0	3,744	5.84	1,143	43	1,186	M	
10	40.4	1 977	52.8	81.0	3,744	5.97	1,181	47	1,228	M	
11	40.5	1,991	53.2	82.0	3,744	6.24	1,242	47	1,289	M	
12	40.7	2,029	54.2	81.0	3,744	5.62	1,141	50	1,191	M	
13	40.8	2,039	54.5	81.0	3,744	5.53	1,128	50	1,178	M	
14	40.9	2,052	54.8	81.0	3,744	5.68	1,165	50	1,215	M	
15	41.0	1,996	53.3	82.0	3,744	5.86	1 171	50	1,221	M	
17	40.9	2,004	53.5	81.0	3,744	5 91	1,185	47	1,232	M	
18	40 9	1,995	53.3	82.0	3,744	6.11	1,218	45	1,263	M	
19	40.6	1,970	52.6	81.0	3,744	6.06	1,193	38	1,231	M	
20	40.5	2,000	53 4	81.0	3,744	5.65	1,131	35	1,166	M	
21	40.5	2,007	53.6	80.0	3,744	5.43	1,090	35	1,125	M	
24	40.5	2,014	53.8	80.0	3,744	5.52	1,173	35	1,208	M	
25	40.5	2,004	53.5	80.0	3,744	6.08	1,219	35	1,254	M	
28	40.2	1,994	53 2	79.0	3,744	5.95	1,186	30	1,216	M	
31	39.8	1,961	52.4	78.0	3,744	5.98	1,173	25	1,198	M	
April...2	39.7	1,956	52.2	78.0	3,744	5.85	1,144	23	1,167	M	
3	39.8	1,959	52.3	79.0	3,744	6.03	1,182	23	1,205	M	
4	39.6	1,965	52.5	78.0	3,744	5.98	1,175	22	1,196	M	
5	39.4	1,958	52.3	79.0	3,744	5.78	1,122	20	1,142	M	
7	39.4	1,953	52.2	78.0	3,744	5.78	1,128	19	1,147	M	
8	39.4	1,957	52.3	78.0	3,744	5.70	1,116	18	1,134	M	
9	39.4	1,960	52.4	78.0	3,744	5.62	1,102	17	1,119	M	
10	39.4	1,920	51.3	78.0	3,744	5.73	1,100	16	1,116	M	
11	39.4	1,918	51.2	77.0	3,744	5.71	1,096	15	1,111	M	
12	39.4	1,935	51.7	78.0	3,744	5.91	1,144	15	1,159	M	
14	39.4	1,930	51.5	77.0	3,744	5.59	1,078	15	1,093	M	
15	39.3	1,943	51.9	77.0	3,744	5.60	1,089	14	1,103	M	
17	39.3	1,943	51.9	78.0	3,744	5.51	1,071	14	1,085	M	
18	39.2	1,941	51.9	77.0	3,744	5.57	1,081	13	1,094	M	
19	39.2	1,955	52.2	77 0	3,744	5.52	1,080	12	1,092	M	
21	39 2	1,917	51.2	77.0	3,744	5.70	1,093	12	1,105	M	
22	39.2	1,921	51.3	77 0	3,744	5 60	1,077	12	1,089	M	
24	39.2	1,943	51.9	77.0	3,744	5.74	1,114	12	1,126	M	
25	39.2	1,942	51.9	76.0	3,744	5.68	1,093	11	1,104	M	
26	39.0	1,959	52.3	77.0	3,744	5.56	1,090	9	1,099	M	
28	38.5	1,894	50.6	75.0	3,744	5.48	1,038	5	1,043	M	
29	38.3	1,895	50 6	76.0	3,744	5.43	1,029	.....	1,029	M	
30	38.2	1,867	49.9	75.0	3,744	5.52	1,031	.....	1,031	M	

M = meter.
F = double floats.
R = rod floats.

Tabulated results and report for January—May, 1890, in Report C. of E. 1890, p. 3171; reprinted in Report C. of E. 1891, p. 3526. Field results and report for Dec. 1890, Report C. of E. 1891, p. 3668, and final results in Report C. of E. 1892, p. 3144.

Mississippi River.—Wilson Point, La.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n, in 100 sq. ft.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	DISCHARGE PER SECOND IN 1000 CUBIC FEET. River.	Bank.	Total.	Method.	Remarks.
1890.	feet.		feet.	feet.	feet.	feet.					
May... 2	38.0	1,858	49.6	75.0	3,744	5.50	1,022	.....	.....	M	
5	37.9	1,894	50.6	75.0	3,744	5.37	1,017	.....	.....	M	
6	37.8	1,899	50.7	73 0	3,744	5.34	1,015	.....	.....	M	
7	37.6	1,896	50.6	.....	3,744	5.17	981	.....	.....	M	
Dec....28	9.8	785	21.5	52.0	3,645	3.29	259	.....	.....	M	
29	9 7	789	21.6	52.0	3,645	3.34	263	.....	.....	M	
30	10.0	788	21.6	52.0	3,645	3.29	259	.....	.....	M	
1891.											
March..27	40 4	2,134	56.3	86.0	3,788	5.70	1,216	16	1,232	M	
28	40.5	2,176	57.5	86.0	3,788	5.76	1,253	19	1,272	M	
30	40.6	2,175	57.4	88.0	3,788	5.83	1,268	20	1,288	M	
31	40.6	2,219	58.6	88.0	3,788	5.40	1,198	21	1,219	M	
April.. 1	40.6	2,233	59.0	86.0	3,788	5.28	1,179	22	1,201	M	
2	40.7	2.244	59.2	86.0	3,788	5.46	1,225	22	1,247	M	
3	40.7	2,221	58.6	86.0	3,788	5.65	1,254	22	1,276	M	
4	40 6	2,218	58.6	85.0	3,788	5.46	1,212	22	1,234	M	
6	40.6	2,229	58.8	86.0	3,788	5.27	1,174	21	1,195	M	
7	40.5	2,247	59.3	86.0	3,788	5.48	1,221	20	1,241	M	
8	40.5	2,268	59.9	84.0	3,788	5.11	1,159	19	1,178	M	
10	40.4	2,253	59.5	85.0	3,788	5.26	1,185	18	1,203	M	
11	40.3	2,288	60.4	84.5	3,788	5.15	1,178	17	1,195	M	
13	40 0	2,245	59.3	83.5	3,788	5.20	1,168	17	1,185	M	
14	40.0	2,219	58.6	83.0	3,788	5.27	1,170	16	1,186	M	
15	39.9	2,248	59.3	82.0	3,788	5.17	1,161	16	1,177	M	
16	39.8	2,241	59.2	82.5	3,788	5.14	1,153	15	1,168	M	
17	39.8	2,239	59 1	82.0	3,788	5.06	1,133	15	1,148	M	
18	39.8	2,231	59.0	82.0	3,788	4.90	1,093	14	1,107	M	
20	39.7	2,232	58.9	80.0	3,788	4.92	1,097	14	1,111	M	
21	39.6	2,240	59.1	81.0	3,788	4.91	1,100	13	1,113	M	
22	39.6	2,279	60.2	81.0	3,788	4.81	1,096	13	1,109	M	
23	39 6	2,305	60.9	81.5	3,788	4.78	1,102	13	1,115	M	
24	39 6	2,338	62.1	81.5	3,788	4.62	1,087	13	1,100	M	
25	39.7	2,347	62.0	81.0	3,788	4.58	1,076	14	1,090	M	
27	39.8	2,339	61.7	83.5	3,788	4.66	1,090	15	1,105	M	
28	39.8	2,331	61.5	83.0	3,788	4.68	1,090	15	1,105	M	
29	39.8	2,311	61.0	84.0	3,788	4.74	1,096	15	1,111	M	
30	39 7	2,275	60.0	83.5	3,788	5.09	1,157	12	1,169	M	
May.... 1	39.5	2,245	59.3	83.0	3,788	4.87	1,094	10	1,104	M	
2	39.3	2,235	59.0	83.0	3,788	5.18	1,158	7	1,165	M	
4	38 8	2,219	58 6	80.0	3,788	4.62	1,024	7	1,031	M	
5	38.4	2,219	58.6	80.0	3,788	4.99	1,108	5	1,113	M	
7	37.0	2,198	58 0	78.0	3,788	4.68	1,030	3	1,033	M	
Oct....16	1.2	681	20.7	37.5	3,295	1.96	133	.....	.....	M	
17	1.0	684	20.8	37.5	3,295	1.95	133	.....	.....	M	
20	0.8	690	21.0	38.5	†3,293	1.94	134	.....	.....	M	
Nov....12	0.0	635	19.4	36 5	3,280	1.84	117	.....	.....	M	
1892.											
April..16	35.6	1,936	49.3	67.0	3,923	5.64	1,091	.....	.....	M	
18	36.6	1,999	50.8	68.0	3,931	5.58	1,116	.....	.....	M	
19	36.8	1,991	50.6	67.5	3,932	5 83	1,160	.....	.....	M	
20	37.2	2,038	51.8	68.5	3 934	5.92	1,207	.....	.....	M	
21	37.4	2,052	52.1	68.0	3,936	5.85	1,199	.....	.....	M	
22	37.8	2,053	52.1	68 5	3,937	5.83	1,197	‡2	1,199	M	
23	38.1	2,116	53.7	70.0	3,939	6.12	1,294	2	1,297	M	
25	38.7	2,165	54.9	70.5	3,942	6.09	1,318	‡3	1 321	M	
26	39.0	2,176	55.2	70.0	3,944	6.16	1,340	4	1,344	M	
27	39.2	2,127	53.9	70.5	3,944	6.32	1,345	5	1,351	M	
28	39.4	2,159	54.7	71.0	3,944	6.42	1,386	6	1,392	M	
29	39.7	2,228	56 5	71.5	3,944	6.28	1,399	7	1,406	M	
30	39.8	2,215	56 1	71.0	3,946	6.03	1,336	8	1,344	M	
May... 2	40.1	2,226	56 4	71.0	3,948	6.14	1,368	‡11	1,379	M	
3	40 2	2,222	56.3	71.0	3,948	6.28	1,395	11	1,407	M	
4	40.3	2,248	56.9	71.5	3,948	5 64	1,268	11	1,279	M	
5	40.5	2,220	56.2	69.5	3,948	6.13	1,361	12	1,372	M	
6	40.6	2,210	56 0	71 5	3,948	6 00	1,326	12	1,337	M	
7	40.7	2.243	56.8	71.0	3,948	6.11	1,371	12	1,383	M	
9	41.0	2,254	57.1	71 0	3,948	6 06	1,366	12	1,378	M	

M = meter.

Discharge of Concord crevasse [550.6] Apr. 18, 1891, = 100,192 cu. ft. per sec.
Tabulated results of 1891 in Report C. of E. 1892, p. 3134; report on reduction, ibid. p. 3123.
" " 1892 " " 1893, p. 3088; " " p. 3078.
Field results and report for 1892 in Report C. of E. 1892, p. 3188.

† Observed.
‡ Interpolated.

MISSISSIPPI RIVER.—WILSON POINT, LA.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n, in 100 sq. ft.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	DISCHARGE PER SECOND IN 1000 CUBIC FEET. River.	DISCHARGE PER SECOND IN 1000 CUBIC FEET. Bank.	DISCHARGE PER SECOND IN 1000 CUBIC FEET. Total.	Method.	REMARKS.
1892.	feet.		feet.	feet.	feet.	feet.					
May...10	40.8	2,247	56.9	71.0	3,948	6.29	1,413	§12	1,425	M	
11	40.8	2,247	56.9	71.0	3,948	5.85	1,315	13	1,328	M	
12	40.8	2,254	57.1	71.0	3,948	6.00	1,352	14	1,366	M	
14	41.0	2,266	57.4	71.5	3,948	5.68	1,287	15	1,302	M	
16	40.8	2,273	57.6	71.5	3,948	5 51	1,252	16	1,269	M	
18	40.8	2,296	58.1	72.5	3,948	5.65	1,298	18	1,315		
a.m. 19	40.8	2,270	57.5	71.5	3,948	5.64	1,279	19	1,298	M	
p.m. 19	.....	.....	.....	.....	.....	5.52	1,252	.....	.....	F	
20	40.8	2,288	58.0	72 0	3,948	5.65	1.292	19	1,312	M	
21	40.8	2,30)	58.2	72.0	3,948	5.74	1.321	20	1,341	M	
24	40.9	2,330	59.0	74.0	3,948	5.66	1,319	22	1,341	M	
25	41.0	2,317	58.7	74.0	3,948	5.44	1,261	23	1,284	M	
26	40.9	2,312	58.6	73.5	3,948	5.64	1,304	24	1,327	M	
27	41.0	2,295	58.1	73.5	3,948	5.80	1,331	24	1,356	M	
27	41.0	2,295	58.1	73.5	3,948	5.60	1,285	.....	.....	F	
28	41.0	2,325	58.9	74.5	3,948	5.86	1,362	25	1,387	M	
a.m. 30	41.0	2,322	58.8	74.0	3,948	5.38	1,250	27	1,286	F	
p. m. 30	.....	.....	.....	.....	.....	5.43	1,267	.....	.....	M	
31	41.0	2,344	59.4	74.0	3,948	5.83	1,366	27	1,393	M	
June... 1	41.1	2,365	59.9	74.0	3,948	5.48	1,296	§28	1,324	M	
2	41.2	2,395	60.7	79.0	3,948	5.38	1,289	27	1,316	M	
3	41.2	2,428	61.5	83.0	3,948	5.20	1,263	26	1,289	M	
4	41.0	2,418	61.2	79.5	3,948	5.36	1,296	25	1,321	M	
a.m.... 6	40.9	2,393	60.6	84.0	3,948	5.08	1,215	23	1,238	M	
p.m.... 6	40.8	2,393	60.6	84.0	3,948	5.11	1,223	22	1,232	F	
7	40.8	2,431	61.6	86.0	3,948	4.98	1,210	.....	.....	M	
8	40.8	2,430	61.6	84 0	3,948	5.05	1,227	21	1,248	M	
9	40.8	2,439	61.8	90.0	3,948	4.87	1,188	20	1,208	M	
10	40.8	2,447	62.0	88.5	3,948	4.86	1,189	19	1,208	M	
‡10	40.8	2,389	60.5	88.5	3,948	4.87	1,163	19	1,182	M	
11	40.8	2,430	61.6	87.0	3,948	4.72	1,148	§18	1,166	M	
13	40 8	2,394	60.6	84.5	3,948	4.91	1,176	18	1,194	M	
14	40.8	2,413	61 1	84.0	3,948	4.80	1,160	18	1,178	M	
15	40.8	2,398	60.7	83.0	3,948	4 88	1,170	18	1,188	M	
16	40.8	2,396	60.7	82.0	3,948	4.90	1,174	18	1,192	M	
17	40.8	2,372	60.1	82.0	3,948	5.05	1,198	18	1,216	M	
‡17	40.8	2,343	59.3	81.5	3,948	5.06	1,183	18	1,201	M	
20	40.6	2,358	59.7	79.0	3,948	4.81	1,133	18	1,151	M	
Oct... 26	0.8	798	24.0	35.5	3,323	1.82	145	....	.....	M	
28	0.8	798	24.0	35.5	3,323	1.81	144	.....	.....	M	
29	0.8	789	23.8	34.0	3,317	1.77	140	.....	.....	M	
Nov. □ 22	1.9	818	24.3	36.5	3,364	2.09	171	.....	.....	M	
1893.											
March. 7	34.4	1,890	49.0	69.0	3,857	5.46	1,032	.....	.....	M	
9	34.8	1,919	49.8	66.5	3,857	5.50	1,055	.....	.....	M	
10	35.1	1,964	50.9	68.0	3,857	5.44	1,069	.. ...	.....	M	
11	35 2	2,003	51.9	68.5	3,858	5.32	1,065	.....	... ...	M	
13	35.3	1,872	48.5	66.0	3,860	5.43	1,016	.....	.....	M	
14	35 1	1,951	50.5	67.0	3,860	5.52	1,077	.....	.....	M	
15	34.8	1,940	50.3	66.5	3,860	5.59	1,085	.....	.....	M	
16	34.5	1,949	50.5	67.5	3,858	5.59	1,090	.....	.....	M	
17	34.3	1,907	49.4	66 0	3,857	5.48	1,045	... ...	..... .	M	
18	33.9	1,836	47.6	66.0	3,857	5.59	1,026	.....	.....	M	
18	.....	.....	.....	.....	.....	5.50	1,009	.....	.....	F	
20	33.5	1,869	48.5	67.0	3,856	5.41	1,011	.....	.....	M	
21	33.3	1,856	48.0	66.5	3,856	5.41	1,004	.....	.....	F	
22	33.1	1,808	46 9	66.5	3,856	5.37	972	.... .	.....	M	
23	33.0	1,804	46.8	65.0	3,856	5.38	971	.....	.....	M	
24	33.0	1,818	47.1	65 0	3,856	5.33	969	.....	.....	M	
24	.....	.....	.....	.....	.....	5.28	959	.....	.....	*M	
25	32.9	1,802	46.7	65.0	3,856	5.30	955	... ...	.....	M	
27	32.9	1,819	47.2	63.5	3,856	5.18	942	.....	.....	M	
27	.....	.....	.....	.....	.....	5.16	939	.....	.....	*M	
28	32.9	1,852	48.0	64.0	3,856	5.16	955	.....	.....	M	
28	.....	.....	.....	.....	.....	5.00	927	.....	.....	*M	
30	32.8	1,798	46.6	63.0	3,856	5.17	930	.....	.....	M	
30	.....	.....	.....	.....	.....	5.17	931	.....	.....	*M	
31	32.6	1,853	48.1	62 5	3,855	5.20	963	.....	.....	M	
31	.....	.....	.....	.....	.....	5.09	944	.....	.....	*M	

The section of 1893 was about 250' below the section used in previous years; the direction was also changed about 40° to make it more nearly perpendicular to the flow. Tabulation, Report C. of E. 1894, p. 2833. Report on work, ibid. p. 2822.

* M = meter moving or flanking across stream. ‡ Piano wire soundings; those of June 10 doubtful. § Observed. □ Results of ordinary method, velocity stations 900 ft. apart.

M = meter. F = double floats

MISSISSIPPI RIVER.—WILSON POINT, LA.—*Continued.*

DATE.		Gauge Reading.	Area of Cross Sec'n, in 100 sq. ft.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	DISCHARGE PER SECOND IN 1000 CUBIC FEET. River.	Bank.	Total.	Method.	REMARKS.
1893.		feet.		feet.	feet.	feet.	feet.					
April..	1	32.3	1,846	47.9	62.5	3,855	5.02	927	.....	.....	M	
	1	.....	.....	.....	.....	.....	4.86	898	.....	.....	•M	
	3	31.7	1,801	46.7	62.5	3,855	4.92	886	.....	.....	M	
	3	.....	.....	.....	.....	.....	4.72	850	.....	.....	•M	
	4	31.3	1,860	48.2	62 5	3,855	4.77	887	.....	.....	M	
	4	.....	.....	.....	.....	.....	4.72	878	.....	.....	F	
	4	.....	.....	.....	.....	.....	4.65	865	.....	.....	•M	
	5	30.7	1,802	46.7	62.5	3,855	4.70	847	.....	.....	M	
	5	.....	.....	.....	.....	.....	4.60	829	.....	.....	•M	
	6	30.1	1,770	45.9	62.5	3,855	4.73	837	.....	.....	M	
	6	.....	.....	.....	.....	.....	4.76	843	.....	.....	•M	
	7	29.6	1,778	46.1	62.0	3,855	4.65	827	.....	.....	M	
	7	.....	.....	.....	.....	.....	4.60	818	.....	.....	•M	
	8	28.7	1,740	45.1	61.0	3,855	4.51	784	.....	.....	M	
	8	.....	.....	.....	.....	.....	4.39	764	.....	.....	•M	
May...	5	37.3	2,079	53.7	72.0	3,871	5.67	1,179	9	1,188	M	
	5	.....	.....	.....	.....	.....	5.55	1,153	.....	.....	•M	
	6	37.9	2,135	55.1	72.0	3,871	5.84	1,246	11	1,238	M	
	6	.....	.....	.....	.....	.....	5.73	1 223	.....	.....	•M	
	8	39.4	2,211	57.1	74.0	3,871	5.91	1,307	17	1,324	M	
	8	.....	.....	.....	.....	.....	5.88	1,299	.....	.....	•M	
	9	39.9	2,212	57.1	75.5	3,871	6.14	1,358	‡20	1,378	M	
	9	.....	.....	.....	.....	.....	6.06	1,340	.....	.....	•M	
	10	40.3	2,222	57.4	74.0	3,871	6.07	1,349	22	1,371	M	
	10	.....	.....	.....	.....	.....	5.96	1,325	.....	.....	•M	
	11	40.6	2,274	58.7	74.0	3,871	6.14	1,396	24	1,420	M	
	11	.....	.....	.....	.....	.....	5.97	1,357	.....	.....	•M	
	12	40.6	2,255	58.2	74.0	3,871	6.13	1,383	25	1,408	M	
	12	.....	.....	.....	.....	.....	6.13	1,382	.....	.....	•M	
	13	40.7	2,272	58.7	75.0	3,871	6.07	1,379	27	1,405	M	
	13	.....	.....	.....	.....	.....	5.96	1,355	.....	.....	•M	
	15	41.0	2,317	59.9	75.0	3,871	5.94	1,376	30	1,406	•M	
	16	41.0	2,273	58.7	73.0	3,871	5.94	1,351	‡31	1,382	M	
	16	.....	.....	.....	.....	.....	5.91	1,344	.....	.....	•M	
	17	41.0	2,303	59.5	73.5	3,871	5.85	1,346	31	1,378	M	
	17	.....	.....	.....	.....	.....	5.74	1,321	.....	.....	•M	
	18	41.0	2,327	60.1	73 5	3,871	5 84	1,359	31	1,391	M	
	18	.....	.....	.....	.....	.....	5.79	1,347	.....	.....	•M	
	19	41.0	2,298	59.4	74.0	3,871	5.95	1,367	31	1,398	M	
	19	.....	.....	.....	.....	.....	5.86	1,346	.....	.....	•M	
	20	41.0	2,312	59.7	74.0	3,871	5.87	1,357	31	1,388	M	
	20	.....	.....	.....	.....	.....	5.76	1,332	.....	.....	•M	
	22	41.0	2,379	61.5	75.0	3,871	5.69	1,355	31	1,386	•M	
	23	41.0	2,350	60.7	74.0	3,871	5.81	1,366	31	1,397	M	
	23	.....	.....	.....	.....	.....	5.73	1,346	.....	.....	•M	
	24	40.3	2,373	61.3	74.0	3,871	6.00	1,424	28	1,452	M	
	24	.....	.....	.....	.....	.....	5.89	1,396	.....	.....	•M	
	25	40.0	2,307	59 6	74.0	3,871	5.91	1,363	24	1,387	M	
	25	.....	.....	.....	.....	.....	5.85	1,349	.....	.....	•M	
	27	39.6	2,308	59.6	73.5	3,871	6.09	1,406	21	1,426	M	
	27	.....	.....	.....	.....	.....	6.01	1,387	.....	.....	•M	
	30	39.4	2,284	59.0	72.0	3,871	5.93	1,355	20	1,375	M	
	30	.....	.....	.....	.....	.....	6 08	1,389	.....	.....	•M	
	31	39.2	2,297	59.3	73.0	3,871	6.10	1,402	20	1,422	M	
June...	1	39.1	2,314	59.8	73.5	3,871	6.00	1,389	19	1,409	M	
	1	.....	.....	.....	.....	.....	5.95	1,378	.....	.....	•M	
	2	39.0	2,286	59.0	71.5	3,871	5.88	1,343	19	1,362	M	
	2	.....	.....	.....	.....	.....	5.84	1,336	.....	.....	•M	

M = meter.
F = double floats.
•M = Meter moving across stream or flanking.

‡Observed.

NOTE.—See Appendix for crevasse measurements.

MISSISSIPPI RIVER.—WILSON POINT, LA.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n, in 100 sq. ft.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	DISCHARGE PER SECOND IN 1000 CUBIC FEET. River.	Bank.	Total.	Method.	REMARKS.
1893.	feet.		feet.	feet.	feet.	feet.					
June... 3	38.9	2,310	59.7	72.0	3,871	5.94	1,372	19	1,391	M	
3	.....	.....	.....	.....	.....	5.70	1,317	.....	.....	*M	
5	38.9	2,283	59.0	71.5	3,871	5.93	1,354	18	1,372	M	
5	.....	.....	.....	.....	.....	5.87	1,340	.....	.....	*M	
6	38.8	2,279	58.9	71.5	3,871	5.82	1,325	18	1,343	M	
6	.....	.....	.....	.....	.....	5.82	1,327	.....	.....	*M	
7	38.8	2,293	59.2	73.0	3,871	5.86	1,344	17	1,362	M	
7	.....	.....	.....	.....	.....	5.75	1,319	.....	.....	*M	
8	38.8	2,319	59.9	73.0	3,871	5.82	1,350	17	1,367	M	
8	.....	.....	.....	.....	.....	5.81	1,347	.....	.....	*M	
Oct.... 24	2 1	739	20.3	33.0	3,636	2.32	172	.....	172	M	
24	.....	.....	.....	.....	.....	2.10	155	.....	.....	*M	
1894.											
Sept.. 26	2.3	439	17.1	27.5	2,571	3.99	175	.....	175	M	
27	2.3	449	17.5	27.5	2,571	3.95	177	.....	177	M	

*M = Meter moving across stream or flanking.

Section of 1894 was located opposite Skipwith Towhead and above the location of former years at Wilson Point. The change was made to avoid the eddy at the old section. 13 velocity stations and 51 soundings each day. Velocities used as observed at $\frac{6}{10}$ depth.

Observations and reduction by 3rd district officer, M. R. C.

Mississippi River.—Hays Landing, Miss.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	100sq.ft	feet.	feet.	feet.	feet.	1000 cu.ft.		
Jan.... 2	29.9	1,367	51.3	91.8	2,665	5.37	734	R	M = meter.
21	34.3	1,615	59.6	99.0	2,710	6.06	978	R	F = double floats.
23, 24	34.6	1,543	56.9	94.7	2,710	5.92	913	R	R = rod floats.
25, 26	35.0	1,556	57.4	96.7	2,710	5.99	932	R	
31	35.7	1,585	57.5	97.5	2,756	5.86	929	R	Observations and reduction by M. R. C. Secretary's office.
Feb.... 1	35.8	1,589	57.7	97.2	2,756	5.85	929	R	
2	35.8	1,608	58.3	95.8	2,756	5.86	942	R	Report and Tabulation, 1882, in Report
6	36.1	1,599	58.0	99.7	2,756	5.97	954	R	C. of E. 1884, p. 2627.
10	36.4	1,653	60.0	99.0	2,756	5.88	972	R	
11	36.4	1,656	60.1	99.4	2,756	6.12	1,014	M&R	All gauge readings at this station are
17	36.9	1,653	60.0	101.8	2,756	5.78	956	R	those of the Hays Landing gauge
21	37.2	1,688	61.2	101.9	2,756	6.04	1,019	R	whose zero was 86.05 feet above the Cairo datum plane.
22	37.2	1,683	59.2	100.1	2,756	5.83	952	R	
23	37.2	1,671	60.6	100.2	2,756	5.84	976	R	
March. 2	37.5	1,699	61.7	100.0	2,756	5.70	968	R	
3	37.3	1,679	60.9	99.0	2,756	5.68	954	R	
6	37.1	1,693	61.4	99.5	2,756	5.96	1,009	R	Hays Landing is 553 miles below Cairo and about 22 miles below Wilson Point.
9	37.8	1,716	62.3	99.0	2,756	5.73	984	R	
13	37.6	1,720	62.4	99.2	2,756	5.71	982	R	
14	37.8	1,704	61.6	100.8	2,765	5.45	928	R	
15	38.0	1,689	61.0	102.2	2,770	5.59	944	M	
16	38.2	1,719	62.0	102.4	2,770	5.73	985	M	
17	38.3	1,722	62.2	102.0	2,770	5 66	974	M	
20	38.6	1,721	61.0	103.8	2,820	5.44	937	M	
23	38.8	1,696	61.6	101.5	2,756	5.57	946	M	
24	38.6	1,693	61.6	102.5	2,756	5.54	940	M	
29	38.1	1,646	59.7	101.7	2,756	5.56	915	R	
April.. 4	35 5	1,648	60.4	96.5	2,730	5.56	916	R	
5	35.4	1,641	60.1	99.5	2,730	5.56	913	M	
6	35.3	1,639	60.1	98.7	2,725	5.66	928	M	
7	35.2	1,634	60.0	98.5	2,725	5.53	903	M	
10	35.0	1,612	59.5	99.5	2,707	5.40	871	M	
13	34.9	1,655	61 1	101.0	2,708	5.57	921	R	
14	34.8	1,604	59.2	98.9	2,708	5.43	871	R	
18	34.6	1,644	60.8	99.2	2,704	5.34	877	R	
19	34.6	1,607	59.4	99.0	2,704	6.04	970	M	
20	34.5	1,664	61 5	99.5	2,704	5.56	926	M	
21	34.4	1,637	60.5	98.5	2,704	5.50	900	M	
26	34.2	1,599	59.3	98.5	2,699	5.36	857	M&R	
27	34.0	1,615	59.8	98.0	2,700	5.14	829	M&R	
28	33.9	1,599	59.2	99.1	2,700	5.18	828	M&R	
May... 1	33.4	1,605	59.7	98.0	2,688	5.29	849	M&R	
2	33.2	1.620	60 3	97.1	2,688	5.15	834	R	
3	33.1	1,589	59.2	95 3	2,686	5.01	797	R	
4	32 9	1,550	57.7	94.0	2,684	4.93	764	R	
5	32.8	1,573	58.6	95.3	2,682	5.02	790	R	
9	32.7	1,564	58.3	95.0	2,682	4 89	764	R	
10	32.8	1,591	59.3	97.5	2,683	5.04	801	R	
11	33.0	1,590	59.2	95.3	2,686	5.21	828	M	
12	33.1	1,589	59.1	96.5	2,687	5.30	842	M	
15	33.7	1,628	60.3	99.0	2,701	5.61	913	M	
17	33.9	1,627	60 2	97.0	2,703	5.32	866	R	
19	34.0	1,630	60.3	96.7	2,704	5.67	924	R	
20	34.1	1,627	60.1	99.0	2,705	5.55	903	R	
24	34.2	1,648	60.9	98.5	2,707	5.56	915	R	
25	34.2	1,609	59 4	98.0	2,707	5.63	906	R	
26	34.2	1,642	60.6	99.8	2,707	5.57	915	R	
29	34.2	1,659	61.3	99.2	2,707	5.87	974	M	
30	34.1	1,661	61 4	98.8	2,707	5.99	995	M	
June... 1	34.2	1,674	61 8	98.8	2,707	6.26	1,049	M	
2	34.1	1 668	61.6	99.9	2,707	6.06	1,011	M	
5	34.1	1,674	61.9	99.2	2,707	6.17	1.033	M	
6	34.1	1,681	62.1	99.8	2,707	6.29	1,058	M	
8	34.1	1,670	61.7	100.0	2,707	6.13	1,024	M	

MISSISSIPPI RIVER.—HAYS LANDING, MISS.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
June... 9	34 1	1,658	61.3	98.0	2,707	6.25	1,036	M	M — meter
13	34 1	1,599	59.1	97.1	2,707	6.13	981	M	R — rod floats.
15	34.0	1,615	59.7	95.2	2,707	5 98	965	M	
16	34.1	1,617	59.7	96.9	2,707	6.19	1,001	M	
19	34.0	1,613	59.6	97.8	2,706	6.22	1,004	M	
21	33.9	1,610	59.5	95.8	2,705	6.14	988	M	
22	33.9	1,601	59.2	95.3	2,705	6.13	981	M	
23	33.8	1,603	59.2	96.7	2 706	6.16	987	M	
29	33.7	1,606	59.4	97.5	2,703	5.91	949	M	
30	33.7	1,606	59.4	97.0	2,702	5.73	920	R	
July... 1	33.7	1,612	59.7	96.8	2,702	5.36	865	R	
3	33.6	1,594	59.0	95.5	2,701	5.57	887	R	
6	33.4	1,581	58.6	95.5	2,696	5.49	868	R	
7	33.3	1,599	59.4	95.3	2,693	5.60	886	R	
12	33.3	1,590	59.1	94.0	2,690	5.44	865	R	
13	33.2	1,582	58.8	94 5	2,690	5.64	893	M	
14	33.2	1,571	58.4	93.8	2,689	5.60	880	R	
15	33.2	1,582	58.8	92.0	2,690	6.04	955	M	
18	33.1	1,608	59.8	96.0	2,690	5.73	922	M&R	
19	33.1	1,607	59.8	97.0	2,689	5.75	924	M	
20	33.0	1,612	60.1	95.0	2,685	5.74	926	M	
25	32.0	1,563	58.2	93 9	2,674	6.02	942	M	
26	31.6	1,551	58.1	92 9	2,671	5.83	904	M	
27	31.1	1,545	57.9	92.9	2,667	5.57	860	M	
28	30.6	1,532	57.5	92.0	2,664	5 40	828	M	
Aug ... 1	27.3	1,458	55.1	88.5	2,646	4.81	701	M	
2	26.1	1,408	53.3	86.2	2,643	4.75	669	M	
3	25.0	1,375	52.2	85.8	2,634	4.57	629	M	
4	23.8	1,357	51.7	85.0	2,628	4.27	580	M	
8	19.8	1,233	47.4	78 5	2,601	3.85	474	M	
10	18.8	1,195	46.0	78.5	2,599	4.12	492	M	
11	18.8	1,196	46.0	77.7	2,599	4.27	510	M	
15	19.7	1,242	47.7	80.0	2,601	4.00	496	R	
16	19.6	1,240	47.7	88.5	2,601	3.92	486	R	
17	19.5	1,235	47.5	80.0	2,599	4.02	496	R	
18	19.4	1,229	47.3	78.9	2,599	3.86	474	R	
22	17.6	1,173	45.4	77.7	2,586	4.18	490	M	
25	16.1	1,136	44.0	75.4	2,579	3.68	418	R	
29	14.6	1,094	42.9	74.0	2.548	3.47	380	R	
30	13.9	1,067	42 0	73.9	2,541	3.34	356	R	
31	13.3	1,055	41.7	72.4	2,529	3.28	346	R	
Sept... 1	12.6	1,031	40.9	71.0	2,522	3.17	327	R	
6	10.9	974	39.0	69.2	2,495	3.19	310	R	
7	10.8	971	39.0	68.5	2,493	3.10	301	R	
8	10.7	969	38.9	69.2	2,490	3.17	307	R	
9	10.6	975	39.2	68.2	2,489	3.20	312	R	
12	10.8	974	39.1	69.5	2,490	3 32	323	M	
13	11.0	988	39 6	69.0	2,496	3.56	352	M	
14	11.1	990	39 6	70.9	2,497	3 40	337	M	
15	11.2	1,014	40 6	71.2	2,497	3.60	365	M	
16	11.1	1,005	40.2	70.0	2,497	3.59	361	M	
18	10.7	980	39.3	69.5	2,491	3.54	347	M	
19	10.4	976	39.3	69.0	2,483	3.50	341	M	
20	10.1	969	39.1	68.9	2,477	3.45	334	M	
21	9.9	948	38.3	68.4	2,476	3.28	311	M	
23	10.4	961	38.7	69.5	2,482	3.19	307	R	
25	11.7	1,006	40.1	71.0	2,508	3.45	347	R	
27	12.3	1,030	40 9	73.0	2,520	3.27	337	R	
28	12.1	1,020	40.6	71.3	2,513	3.18	325	M	
29	11.6	1,020	40.7	71.0	2,507	3.02	307	M	
30	11.0	979	39.2	69.9	2,498	3.01	294	M	
Oct.... 2	9.7	963	39.0	69.0	2,469	3.06	294	M	
3	9.0	950	38.9	70.1	2,445	2 91	277	M	
6	7.4	909	37.7	67.4	2,414	2.69	245	M	
7	6.9	889	37.0	66.8	2,399	2.70	240	M	
10	6.4	890	37.2	66.9	2,392	2.60	232	M	

MISSISSIPPI RIVER.—HAYS LANDING, MISS.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Oct.... 13	6.6	890	37.1	65.9	2,394	2.62	234	M	M = meter.
14	6.4	888	37.1	65.9	2,394	2.63	233	M	F = double floats.
17	6.2	881	36.8	65.9	2,390	2.28	201	M	R = rod floats.
23	6.6	904	37.8	66.1	2,394	2.84	257	M	
24	6.7	904	37.7	63.1	2,394	2.65	240	M	
25	7.0	910	37.9	66.9	2,399	2.68	244	M	
26	7.0	909	37.9	67.5	2,401	2.64	240	M	
27	6.8	896	37.3	66.0	2,399	2.68	240	M	
28	6.6	891	37.1	65.9	2,399	2.62	233	M	
30	6.5	891	37.2	65.9	2,397	2.56	228	M	
31	6.4	893	37.3	66.0	2,396	2.56	229	M	
Nov.... 1	6.3	889	37.1	66.1	2,394	2.50	222	M	
2	6.2	880	36.8	66.8	2,389	2.52	222	M	
3	6.0	868	36.4	65.2	2,387	2.51	218	M	
4	6.1	864	36.2	65.2	2,388	2.55	221	M	
6	6.2	864	36.2	65.8	2,389	2.61	225	M	
7	6.2	866	36.3	65.4	2,389	2.64	228	M	
8	6.2	870	36.4	65.0	2,389	2.57	223	M	
9	6.3	886	37.1	65.2	2,391	2.61	231	M	
10	6.4	862	36.0	66.1	2,392	2.61	225	M	
11	6.4	873	36.5	66.1	2,392	2.63	230	M	
13	6.7	869	36.3	66.1	2,395	2.75	239	M	
14	6.8	891	37.2	66.2	2,396	2.74	244	M	
15	7.0	896	37.3	67.1	2,402	2.80	251	M	
16	7.3	879	36.5	66.9	2,407	2.86	251	M	
17	7.6	894	37.0	67.0	2,416	2.92	261	M	
20	8.7	912	37.3	68.1	2,448	3.01	275	M	Results of Feb. 18 in Report C. of E. 1891, p. 3488.
21	9.0	929	37.9	68.5	2,450	3.07	285	M	
22	9.1	936	38.1	68.8	2,453	3.09	289	M	
23	9.3	943	38.3	69.8	2,462	3.10	293	M	Observa'ns of March 16 taken by "Patrol" party, Report C. of E. 1885, p. 2650.
1884.									
Feb....18	35.3	1,595	56.8	84.0	2,810	7.50	1,195	M	
Mch...16	37.7	1,713	.....	.....	.....	6.23	1,067	.....	

Mississippi River.—Vicksburg, Miss.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1858.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Feb....24	31.3					5.38	734	F	F = double floats.
25	31.2					5.37	731	F	
26	30.9					5.39	730	F	Results of 1858 taken from Report on the Mississippi River by Captain A. A. Humphreys and Lt. H. L. Abbot, 1861, p. 598, edition of 1876.
27	30.7					5.31	717	F	
March. 4	28.2					5.39	693	F	
5	27.9					5.34	683	F	
6	27.8					5.25	671	F	
8	28.4					5.52	713	F	
9	28.9					5.57	726	F	
10	29.6					5.66	748	F	The gauge readings have been reduced to present Engineer gauge at Vicksburg by subtracting 1.3 feet from readings originally published by H and A.
11	30.2					5.71	764	F	
12	30.7					5.75	777	F	
13	31.2					5.78	788	F	
15	32.3					5.81	808	F	
17	32.7					6.03	844	F	
18	32.9					6.04	849	F	Zero of present gauge is 66.04 ft. above the Cairo datum plane.
19	33.0					5.96	840	F	
20	33.2					5.95	842	F	
23	35.7					6.41	947	F	
24	36.6					6.40	961	F	
25	37.6					6.49	990	F	
26	38.6					6.55	1,017	F	
27	39 5					6.61	1,042	F	
29	41.1					6.74	1,091	F	
30	41.7					6.79	1,109	F	
31	42.5					6.78	1,122	F	
April.. 1	43.1					6.76	1,129	F	
2	43.6					6.72	1,131	F	
3	44.1					6.71	1,139	F	
5	44.5					6.70	1,144	F	
6	44.6					6.72	1,149	F	
7	44.9					6.64	1,140	F	
8	45.0					6.62	1,141	F	
9	45.1					6.63	1,143	F	
10	45.2					6.60	1,139	F	
12	45.3					6.67	1,152	F	
13	45.2					6.69	1,154	F	
14	45.0					6.71	1,154	F	
15	44 8					6.69	1,147	F	
16	44.6					6.65	1,138	F	
17	44.4					6.62	1,129	F	
20	44.4					6.47	1,103	F	
21	44.4					6.45	1,099	F	
22	44.5					6.51	1,111	F	
23	44.6					6.57	1,123	F	
24	44.8					6.61	1,130	F	
26	45.0					6.64	1,144	F	
27	45.1					6.65	1,146	F	
28	45.2					6.61	1,141	F	
29	45.4					6.59	1,141	F	
30	45.5					6.59	1,143	F	
May.... 1	45.6					6.68	1,160	F	
3	45.8					6.67	1,162	F	
4	45.9					6.68	1,165	F	
5	45.9					6.69	1,167	F	
6	45.9					6.75	1,178	F	
7	46.0					6.72	1,174	F	
8	46.0					6.76	1,181	F	
10	46.1					6.86	1,200	F	
11	46.2					6.90	1,209	F	
12	46.1					6.86	1,200	F	
13	46.1					6.92	1,211	F	
14	46.0					6.89	1,204	F	
15	46.0					6.97	1,218	F	
17	46.0					7.00	1,223	F	

MISSISSIPPI RIVER.—VICKSBURG, MISS.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1858.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
May...18	46.1	.....	.....	.....	.....	7.00	1,224		F = double floats.
19	46.1	.....	.....	.....	.....	7.03	1,230		
20	46.1	.....	.....	.....	.....	7.01	1,225		
22	46.1	.....	.....	.....	.....	7.04	1,232		
24	46.2	.....	.....	.....	.....	7.05	1,235		
25	46.2	.....	.....	.....	.....	7.05	1,235		
26	46.2	.....	.....	.....	.....	7.00	1,227		
27	46.2	.....	.....	.....	.....	7.00	1,227		
28	46.3	.....	.....	.....	.....	7.05	1,236		
29	46.3	.....	.....	.....	.....	7.02	1,233		
June... 1	46.3	.....	.....	.....	.....	7.02	1,232		
2	46.3	.....	.....	.....	.....	7.07	1,241		
3	46.3	.....	.....	.....	.....	7.02	1,233		
4	46.4	.....	.....	.....	.....	7.06	1,241		
5	46.4	.....	.....	.....	.....	7.07	1,242		
7	46.5	.....	.....	.....	.....	7.03	1,238		
8	46.5	.....	.....	.....	.....	6.97	1,227		
9	46.6	.....	.....	.....	.....	6.89	1,214		
10	46.6	.....	.....	.....	.....	6.92	1,220		
12	46.8	.....	.....	.....	.....	6.95	1,229		
14	46.8	.....	.....	.....	.....	6.87	1,216		
15	46.8	.....	.....	.....	.....	6.89	1,219		
16	46.8	.....	.....	.....	.....	6.85	1,212		
17	46.8	.....	.....	.....	.....	6.89	1,218		
18	46.8	.....	.....	.....	.....	6.91	1,222		
19	46.8	.....	.....	.....	.....	6.89	1,218		
21	46.7	.....	.....	.....	.....	6.97	1,231		
22	46.9	.....	.....	.....	.....	6.99	1,238		
23	46.9	.....	.....	.....	.....	6.97	1,234		
24	46.9	.....	.....	.....	.....	7.03	1,244		
25	46.9	.....	.....	.....	.....	7.01	1,242		
26	47.0	.....	.....	.....	.....	6.94	1,231		
28	46.9	.....	.....	.....	.....	6.83	1,209	F	
29	46.9	.....	.....	.....	.....	6.82	1,207		
30	46.8	.....	.....	.....	.....	6.82	1,206		
July.... 1	46.8	.....	.....	.....	.....	6.88	1,216		
2	46.8	.....	.....	.....	.....	6.90	1,219		
3	46.7	.....	.....	.....	.....	6.90	1,219		
6	46.7	.....	.....	.....	.....	6.86	1,212		
7	46.7	.....	.....	.....	.....	6.86	1,212		
8	46.7	.....	.....	.....	.....	6.91	1,220		
9	46.7	.....	.....	.....	.....	6.93	1,224		
10	46.7	.....	.....	.....	.....	6.94	1,226		
12	46.8	.....	.....	.....	.....	6.90	1,220		
13	46.8	.....	.....	.....	.....	6.89	1,218		
14	46.8	.....	.....	.....	.....	6.91	1,222		
15	46.8	.....	.....	.....	.....	6.90	1,220		
16	46.8	.....	.....	.....	.....	6.90	1,221		
17	46.8	.....	.....	.....	.....	6.95	1,229		
20	46.6	.....	.....	.....	.....	6.91	1,218		
21	46.5	.....	.....	.....	.....	6.91	1,216		
22	46.4	.....	.....	.....	.....	6.93	1,218		
23	46.3	.....	.....	.....	.....	6.90	1,210		
24	46.1	.....	.....	.....	.....	6.79	1,189		
26	45.7	.....	.....	.....	.....	6.72	1,170		
27	45.6	.....	.....	.....	.....	6.65	1,155		
28	45.5	.....	.....	.....	.....	6.68	1,158		
29	45.4	.....	.....	.....	.....	6.67	1,155		
30	45.2	.....	.....	.....	.....	6.65	1,148		
31	45.1	.....	.....	.....	.....	6.66	1,147		
Aug... 2	44.7	.....	.....	.....	.....	6.63	1,137		
3	44.5	.....	.....	.....	.....	6.54	1,117		
4	44.3	.....	.....	.....	.....	6.49	1,104		
6	43.6	.....	.....	.....	.....	6.45	1,086		
7	43.2	.....	.....	.....	.....	6.38	1,067		

Mississippi River.—Vicksburg, Miss.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1858.	feet.	100sq.ft	feet.	feet.	feet.	feet.	1000 cu.ft.		
Aug.... 9	42 2					6.23	1,026		F = double floats.
11	40.9					6.16	993		
12	40.5					6 13	982		
13	39.9					5.99	951		
16	38.4					5.88	909		
17	37.8					5.90	904		
18	37.3					5.81	882		
19	36.8					5 80	873		
20	35.8					5.81	860		
21	35.2					5.69	832		
23	34.2					5.50	791		
24	33.2					5.44	768		
25	32.9					5.33	749		
26	32.1					5.15	714		
28	29.8					5.04	672		
31	26.3					4 64	575		
Sept.... 1	25.2					4.47	541		
2	25 2					4.48	534		
3	23.4					4.53	528		
4	22.6					4.54	520		
9	20.5					4.14	452		
10	20.0					4.09	443		
11	19.3					4.09	436		
13	18.0					3.99	412		
14	17.4					3.98	405		
15	16.8					3.86	387		
16	16.4					3.85	382		
17	15.9					3.90	383	•	
18	15 6					3.92	381		
20	16.1					3.91	385		
21	16.6					3.97	396	F	
22	17.1					4.03	407		
23	17.2					4.09	414		
24	17.3					4.02	408		
25	17.2					3.89	394		
27	16.7					3 85	385		
30	15 3					3.73	361		
Oct..... 1	14.8					3.65	348		
4	13.1					3 54	328		
5	12.7					3.55	321		
6	12.4					3.44	308		
7	11.9					3.37	297		
8	11.6					3.32	290		
9	11.2					3 34	289		
12	10.4					3.19	270		
13	10.1					3.17	266		
14	9.8					3.09	257		
15	9.5					3.19	263		
16	9.2					3.14	257		
25	7 4					3.02	233		
26	7.3					3 06	236		
Nov.... 8	14.0					3 79	354		
9	16.4					4.07	405		
10	18.1					4.58	474		
11	20.1					4.77	517		
13	23.4					5.09	594		
16	24.1					4.95	586		
17	23.8					4.72	556		
19	22 8					4 59	528		
20	22.3					4.57	520		

Mississippi River.—Vicksburg, Miss.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1858.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Nov....23	20.3	.....	.....	.....	.....	4.44	484		F = double floats
24	19.8	.....	.....	.....	.....	4.24	457		
25	18.9	.....	.....	.....	.....	4.23	447		
26	18.5	.....	.....	.....	.....	4.04	422		
27	17.9	.....	.....	.....	.....	4.05	417		
30	16.1	.....	.....	.....	.....	4.03	397		
Dec.... 1	15.8	.....	.....	.....	.....	3.75	367		
2	15.3	.....	.....	.....	.....	3.75	362		
3	14.7	.....	.....	.....	.....	3.66	348	F	
4	14.2	.....	.....	.....	.....	3.65	342		
6	13.4	.....	.....	.....	.....	3.56	327		
8	13.9	.....	.....	.....	.....	3.63	339		
9	14.5	.....	.....	.....	.....	3.70	350		
10	15.6	.....	.....	.....	.....	4.11	400		
13	20.8	.....	.....	.....	.....	4.73	518		
15	25.0	.....	.....	.....	.....	5.35	615		

Mississippi River.—Warrenton, Miss.

1884.									
Oct.... 8	13.6	888	36.2	61.0	2,451	4 63	411	M	M = meter.
14	17.9	989	38.3	63.0	2,581	4.65	461	M	
15	17.6	975	38.2	64.2	2,555	4.33	422	M	Tabulated results in Report of C. of E. 1887, p. 2743. Report, ibid. p. 2840.
16	17.0	969	38 0	64 9	2,553	4 20	407	M	
17	16 4	950	37.8	63.8	2,518	4.58	430	M	
22	15.8	917	36.6	62.0	2,509	4.02	369	M	The sections of 1881-5 are about ½ mile below the landing at Warrenton, Miss. Observations and reduction under the Secretary M. R. C.
25	15 6	896	35.8	62.0	2,508	4.32	389	M	
28	14.6	889	36.2	60.2	2,454	3.80	337	M	
30	14.0	873	35.7	59.5	2,444	3.84	335	M	
Nov.... 4	14.0	850	34.8	59.8	2,444	3.94	335	M	
6	13.7	836	34.3	59.2	2,438	4.03	337	M	
8	13.4	846	34 8	59 3	2,453	3.97	336	M	
10	12.7	826	34.3	58.9	2,410	3.79	313	M	The gauge readings are those of the standard U. S Engineer gauge at Vicksburg whose zero is 66.04 feet above the Cairo datum plane. Warrenton is about 6 miles below Vicksburg.
14	10 3	763	33.1	56.3	2,303	3.60	275	M	
15	9.8	759	33 2	55.8	2,287	3.70	280	M	
17	8.7	723	32.1	54.1	2,255	3.44	249	M	
19	7.7	702	31.6	55 0	2,222	3.44	242	M	
22	6 5	666	30.4	53.7	2,192	3.51	236	M	
24	6.3	670	30.9	53.8	2,172	3.38	226	M	
27	6.0	663	30 7	53.0	2,160	3.55	235	M	
29	5 8	649	30.1	53.3	2,155	3.34	217	M	
Dec.... 1	5.9	658	30 4	53.8	2,160	3 61	237	M	
3	7.0	681	30.9	53.8	2,202	3 25	221	M	
4	7.8	696	31.3	54 8	2,221	3 55	247	M	
6	9.0	705	31.4	55.4	2,244	3.65	257	M	
9	8.3	696	31.4	55.5	2,214	3 48	239	M	
10	7.7	680	31.0	55.3	2,196	3.65	248	M	
12	6.2	662	30.3	54.1	2,180	3.39	224	M	
13	5.6	646	29.6	52 6	2,180	3.34	216	M	
15	4.8	634	29 1	52 3	2,177	3 30	209	M	
1885.									
Jan.... 2	20.4	1,056	38 7	69.1	2,735	5 02	530	M	
8	34.2	1,492	46.6	81.6	3,205	5 94	886	M	
10	36.0	1,512	46.0	84 2	3,288	5 97	903	M	
12	37.2	1,540	46 0	85.1	3,348	5.76	887	M	
13	37.6	1,549	45.7	85.4	3,388	6.37	987	M	
18	40.2	1,616	46.0	86.7	3,510	6.24	*1,008	M	
21	41.0	1,706	47 0	90.4	3,626	6 40	†1,092	M	
22	41.2	1,710	46 9	90 3	3,650	6.73	1,151	M	
23	41 4	1,725	47 0	90 8	3,672	6.38	‡1,101	M	
25	41.8	1,754	47.5	90.7	3,696	6.18	1,085	M	
28	42.0	1,758	45.8	90.6	3,840	5.86	1,030	M	
29	42.2	1,756	45.8	89.4	3,835	6.26	1,099	M	
30	42.2	1,758	45.8	89 6	3,876	6.10	‡1,072	M	

* Slough discharge = 3,002.
† " " = 4,296.
‡ " " = 3,700.
" " = 6,640.

MISSISSIPPI RIVER.—WARRENTON, MISS.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1888.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Feb... 2	42 4	1,804	47.3	90.6	3,812	5.88	1,060	M	M = meter
5	42 2	1,766	46.5	91.6	3,800	6.09	1,076	M	
7	41.4	1,797	49.2	89.3	3,654	5.87	1,055	M	
9	40.0	1,685	47.2	84.8	3,563	.....	.....	M	
14	36.0	1,534	45.3	79.4	3,386	5.05	774	M	
16	34.9	1,540	45.8	80.5	3,366	5.23	806	M	
19	34.0	1,528	46.2	81.9	3,308	5.12	783	M	
21	33.8	1,503	45.7	81.1	3 292	5.24	787	M	
23	33.0	1,475	45.1	78.9	3,272	5.22	770	M	
25	32.2	1,477	45.5	80.2	3,249	4.89	723	M	
26	31.8	1,433	44.9	78.6	3,193	4.77	684	M	
27	30.2	1,402	44 6	77.9	3,146	4.61	646	M	
28	28.8	1,389	44.1	76 0	3,106	4 50	616	M	
March. 2	26.0	1,255	41.9	72.5	2,996	4.31	541	M	
3	24.7	1,209	40.9	70.8	2,961	4.35	526	M	
4	23.6	1,186	40.4	70 4	2,946	4 19	497	M	
5	23.0	1,192	41.3	67.8	2,888	4.11	490	M	
6	22.6	1,163	40.4	66 9	2,875	4.08	475	M	‖New section 200 feet above the old one.
7	22.4	1,157	40.3	66 8	2,871	4.17	483	M	
9	22.7	1,197	41.8	67.2	2,860	4.23	507	M	
11	23.5	1,203	41.5	68.9	2,897	4.39	529	M	
12	24.2	1,233	42.3	69.8	2,917	4.38	540	M	
13	25.0	1,243	42 3	69 4	2,93.)	4.46	554	M	
14	26 2	1,289	43.0	70.7	2,995	4.54	585	M	
16	28.6	1,331	43.5	73.0	3,055	4 79	637	M	
17	29 4	1,383	44 6	75.3	3,100	4.80	664	M	
19	30.8	1,405	44 6	75.8	3,135	4.88	686	M	
21	32.2	1,462	45 4	77.1	3,220	4.94	722	M	
23	33.4	1,487	44 8	78.4	3,321	5.24	779	M	
26	34.5	1,550	45 6	80 7	3,352	5.28	808	M	
30	34.2	1,474	44.0	79.5	3,351	5.18	763	M	
31	33 8	1,488	44.7	79.3	3,331	5.10	759	M	
April.. 1	33.3	1,491	45.0	79 3	3,313	4.72	704	M	
4	31.4	1,410	43.4	76.8	3,251	4.84	682	M	
6	29.6	1,327	41.9	74.5	3,166	4.80	637	M	
1889.									
March. 15	32.4	1,456	42.3	78.6	3,439	4.86	707	M	The observations of 1889 and 1890 made by M. R. C., 4th district officer, and reduction by the Secretary.
16	31.9	1,459	42.6	79.4	3,421	4.80	701	M	
20	29.2	1,383	41 2	77.0	3,357	4.78	662	M	
21	28.6	1,333	3..9	76 1	3.343	4 62	615	M	
22	28.0	1,306	39.3	74.9	3,325	4.63	605	M	
23	27.4	1,309	39 7	74.0	3,302	4.53	593	M	
26	25.9	1,273	39.0	72.9	3,267	.....	.....	M	The section was about 2,800 feet below the landing at Warrenton and about 200 ft. above the section of 1885 and oblique to it.
27	25.6	1,238	38.0	71 2	3,257	4.28	530	M	
28	25.6	1.241	38.1	71.3	3,253	4.36	541	M	
29	26.2	1,264	38.7	71.3	3,264	4.70	594	M	
30	27 4	1,322	40.2	72.5	3,287	4.77	631	M	
April.. 1	29.4	1,414	42 2	74 3	3,351	5.01	709	M	
2	29 9	1,422	42.3	75 3	3,360	5 03	715	M	
3	30.2	1,405	41.7	74.8	3,368	4.98	700	M	Tabulation, Report C. of E., 1891, pp. 3512 and 3538.
4	30.3	1,399	41.5	75.8	3,370	4.93	690	M	
5	30.2	1,409	41.8	75.7	3,369	4.93	695	M	
6	30 0	1,417	42.1	75.7	3,369	4.94	700	M	
8	29.4	1,396	41.6	75.4	3,355	4.78	668	M	
10	28.6	1,370	41.1	74.7	3,335	4.75	650	M	
11	24.2	1,355	40.8	73.8	3,325	4.66	631	M	
12	27.9	1,334	40.2	73.6	3,316	4.67	622	M	
13	27 6	1,333	40 4	74.8	3,304	4.63	617	M	
15	27.3	1,335	40.5	74.8	3,294	4.55	608	M	
16	26.8	1,325	40.3	74 8	3,285	4.52	†599	M	† Unreliable.
17	26 2	1,303	39.7	74.3	3,278	4.58	596	M	
18	25.7	1,280	39.2	73.3	3,264	4.42	565	M	
19	25.1	1,251	38.5	72.7	3,250	4 44	556	M	
20	24.6	1,233	38.1	71.6	3,234	4.31	532	M	
22	23.5	1,188	36 9	70 5	3,223	4 39	522	M	
23	23 2	1,172	36.4	69 6	3,219	4 32	506	M	

Mississippi River.—Warrenton, Miss.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n, in 100 sq. ft.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	DISCHARGE PER SECOND IN 1000 CUBIC FEET. River.	Bank.	Total.	Method.	REMARKS.
1889.	feet.		feet.	feet.	feet.	feet.					M = meter. F = double floats.
April. 24	23.0	1,162	36.2	69.6	3,208	4.41	512	.....	.....	M	
25	23.1	1,156	36.0	69.4	3,208	4.44	513	.....	.....	M	
26	23.2	1,161	36.2	69.6	3,211	4.36	506	.....	.....	M	
27	23.6	1,180	36.9	70.7	3,221	4.44	528	.....	.....	M	
30	25.2	1,246	38.5	71.7	3,239	4.68	582	.....	.....	M	
May... 3	25.8	1,271	39.0	72.6	3,261	4.56	580	.....	.....	M	
4	25.2	1,258	38.6	72.0	3,246	4.56	573	.....	.....	M	
6	23.2	1,166	36.2	69.5	3,221	4.41	514	.....	.....	M	
7	22.0	1,134	35.6	68.2	3,186	4.31	489	.....	.....	M	
9	19.4	1,051	33.7	66.1	3,113	4.13	434	.....	.....	M	
10	18.4	1.008	32.8	60.5	3,079	4.06	409	.....	.....	M	
11	17.6	981	31.9	59.5	3,071	3.98	391	.....	.....	M	
13	16.2	944	31.4	58.8	3,002	3.94	372	.....	.....	M	
14	15.7	919	30.7	58.4	2.990	4.00	368	.....	.....	M	
15	15.2	908	30.5	57.4	2,977	3 95	359	.....	.....	M	
16	15.0	896	30.1	57.5	2,977	4.00	358	.....	.....	M	
17	14.9	888	29.8	57.2	2,975	4.02	357	.....	.....	M	
18	14.9	889	29 9	57.5	2,975	4.02	357	.....	.....	M	
20	14.4	854	28.8	55.0	2.966	4.04	345	.....	.....	M	
21	13.8	848	28.7	56.3	2,950	4.01	340	.....	.....	M	
22	13.4	831	28.3	55.6	2,935	3.93	326	.....	.....	M	
23	13.2	822	28.0	54.7	2.935	3.94	324	.....	.....	M	
24	13.2	816	27 9	54.5	2,924	3.97	324	.....	.....	M	
25	13.2	817	27.9	54.4	2.924	4.05	331	.....	.....	M	
27	13.3	813	27.8	54.4	2,921	4 02	327	.....	.....	M	
28	13.9	841	28.5	54.8	2,947	4.04	340	.....	.....	M	
29	15 2	866	29.1	55.4	2,977	4.38	379	.....	.....	M	
31	18.8	953	30.8	59.3	3,093	4.44	423	.....	.....	M	
1890.											
March. 4	46.3	1,966	57.1	102.5	3,441	6.28	1,234	2	1,236	M	
5	46.4	1,963	57.0	102.0	3,441	6.29	1,234	2	1,236	M	
6	46.5	1,965	57.1	102.2	3,441	6.30	1,238	2	1.211	M	
7	46.6	1,974	57.4	104.0	3,441	6.33	1,250	3	1,253	M	
April 11	47 7	2.066	60.0	109.0	3,441	6 32	1,306	3	1,309	M	
12	47.9	2,073	60.3	109.7	3,441	6.37	1,321	4	1,324	M	

Mississippi River.—Waterproof Cut-off.

1884.										
May...25	‡40.7	727	51.9	73.0	1,401	*6.46	469	.....	.....	M
							¶370	.....	.....	
Total.	.....	.....	.....	.....	.....	.....	839	.....	.....	
July...28	21.0	752	59 1	110.0	1,273	†4.05	304	.....	.....	F
							¶231	.....	.....	
Total..	.....	.....	.....	.....	.....	.....	535	.....	.....	

Waterproof, La., is 663 miles below Cairo.

The discharges through the old channel were observed about the same times, and computed to be 370,465 cubic feet per second in May, and 231,174 cubic feet per second in July.

¶ Discharge through old channel.

* The velocity observations were taken about 100 feet above the section sounded. Water surface was 87.326 feet above the Cairo datum plane.

† In computing the velocities the average departure of the floats, 46.5 feet was assumed for each path.

‡ St. Joseph gauge.

Report C. of E. 1891, p. 3488.

Mississippi River.—Natchez, Miss.

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1858.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Jan.... 8	37.9	.....	.....	.....	.....	4.79	845		F = double floats.
9	37.5	.....	.....	.....	.....	4.71	836		M = meter.
11	37.4	.....	.....	.....	.....	4.66	826		
12	37.5	.....	.....	.....	.....	4.73	840		Taken from Humphreys and Abbot's Report on the Mississippi River, page 597, edition of 1876.
13	38.2	.....	.....	.....	.....	4.88	879		
18	40 6	.....	.....	.....	.....	4.80	915		
20	40.4	.....	.....	.....	.....	4.74	901		
21	40.3	.....	.....	.....	.....	4.69	889		
22	40.1	.....	.....	.....	.....	4.72	877		
23	39 9	.....	.....	.....	.....	4.62	869		4.7 feet have been subtracted from gauge readings of 1858 as originally published to reduce them to present U. S. Engineer gauge at Natchez, whose zero is 6.89 feet above the Cairo datum plane.
28	39 6	.....	.....	.....	.....	4.69	875		
29	39 6	.....	.....	.....	.....	4.67	871		
30	39 6	.....	.....	.....	.....	4.69	874		
Feb ... 1	39.9	.....	.....	.....	.....	4.77	895	F	
4	39 9	.....	.....	.....	.....	4.69	881		
5	39.8	.....	.....	.....	.....	4.61	864		
6	39.4	.....	.....	.....	.....	4.60	842		
8	38.7	.....	.....	.....	.....	4.52	826		
9	38 3	.....	.....	.....	.....	4.47	809		
10	37.9	.....	.....	.....	.....	4.48	803		
11	37.6	.....	.....	.....	.....	4.46	793		
13	37.6	.....	.....	.....	.....	4.54	795		
16	36.9	.....	.....	.....	.....	4.41	771		
17	36 7	.....	.....	.....	.....	4.45	763		
18	36.3	.....	.....	.....	.....	4.37	754		
19	36.1	.....	.....	.....	.....	4.39	754		
20	35.6	.....	.....	.....	.....	4.37	741		
1890.									
Mch. a 17	46.6	1,471	69.8	118.0	2,108	9.36	1,376		a = a. m.
b 17	.....	.....	.....	.....	.....	9.46	1,392		b = p. m.
1891.									
March 24	46.1	1,561	73.7	105.3	2,117	9.21	1,437		
25	46.1	1,558	73.6	105.8	2,117	9.66	1,506		
26	46.2	1,564	73 3	107.2	2,121	8.83	1,372		
27	46.2	1,564	73 8	106.7	2,119	8.94	1,399		
28	46.2	1,577	74.4	111.8	2,119	8.83	1,393		
29	46.2	1,559	73.5	110.9	2,122	8.76	1,365		
30	46.2	1,566	73 8	111.2	2,123	9.74	1,525		
31	46 3	1,585	74.4	109.4	2,130	9.46	1,499		Observations by 4th district officer and reduction by Secretary M. R. C.
April.. 1	46.4	1,547	72.6	116.6	2,130	8 93	1,382		
2	46.4	1,515	71.1	109.7	2.130	9.63	1,459		
3	46.4	1,482	69.6	106.2	2,130	9.13	1,353		
4	46.4	1,511	70.8	107.1	2,135	9 16	1,384		Tabulation of 1890 Report C. of E. 1891, p. 3558; of 1891, C. of E. 1892 p. 3136; and of 1893 C. of E. 1893 p. 3690.
6	46.4	1,529	71 6	109.5	2,135	8.93	1,365		
7	46.4	1,526	71.5	115 4	2,135	8.91	1,359		
8	46.4	1,506	73.4	116.5	2,135	9.02	1,413		
9	46 4	1,487	69.7	118.4	2,135	9.02	1,341	M	
11	46.5	1,511	70.8	115.5	2,135	8.94	1,351		
13	46.4	1,455	68.3	119.0	2,130	9.33	1,358		Reports on observations, C. of E. 1892, p. 3125, and 1893, p. 3679.
14	46.4	1 470	69 2	118.7	2,124	8.95	1,316		
15	46.4	1,433	67.6	118.9	2,119	9 22	1,321		
16	46.3	1,429	67.4	118.9	2,119	9.09	1,299		
1892.									
May...†16	47.0	1,511	69.5	119.3	2.173	9.15	1,383		† Observations unreliable.
†17	47.1	1,503	69.2	120.2	2 173	9.10	1,368		
†19	47 2	1,531	70.5	120.3	2,173	8.93	1,367		
20	47.2	1,541	70.9	123 8	2,173	9.21	1,419		
21	47.1	1,515	69.7	125.0	2,173	9.26	1,402		
23	47.1	1,542	71.0	119 8	2,173	9.18	1,416		
25	47.1	1,531	70.5	128.1	2,173	9.11	1,395		
26	47.0	1,513	69.6	121 4	2.173	9.06	1,371		
27	47.0	1.552	71.4	119.0	2,173	8 90	1,381		
28	47.1	1,506	69 3	118.6	2,174	8.70	1,310		
30	47.1	1,528	70 3	122.8	2,174	8.76	1,339		
31	47.2	1,510	69.4	124.3	2.175	9 02	1,363		
June... 2	47.4	1.540	70 8	121.0	2,176	8.99	1,385		
3	47.4	1,588	72.9	128 4	2,177	8.83	1,403		
6	47.4	1.534	70.5	119.6	2,177	9.18	1,408		

Mississippi River.—Natchez, Miss.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1892.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
June.. 7	47.4	1,529	70.2	117.6	2,177	8 94	1,367	M	M = meter.
14	47.6	1,532	70.3	121.3	2,178	8.58	1,315	M	F = double floats.
15	47.7	1,586	72.8	123 5	2,178	8 46	1,341	M	R = rod floats.
16	47.7	1,606	73.7	124.0	2,178	8.48	1,362	M	
17	47 8	1,568	72.0	121.6	2,178	8.49	1,331	M	
18	47.9	1,557	71.5	120.9	2,178	8.41	1,309	M	
19	48.0	1,570	72.1	122.3	2,178	8.11	1,273	M	
20	48.0	1,578	72.5	123.1	2,178	8.39	1,324	M	
21	48.1	1,523	69.9	120.2	2,179	8.68	1,322	M	
22	48.1	1,563	71.7	122.2	2,179	8.68	1,357	M	
† 23	48.1	1,584	72.7	122.5	2,179	8.14	1,289	M	† Observations unreliable.
† 24	48.1	1,599	73.4	122.3	2,179	8.22	1,315	M	
25	48.1	1,619	74.3	123.1	2,179	8.12	1,314	M	
27	48.1	1,652	75.8	122.8	2,179	8.07	1,333	M	
28	48.0	1,678	77.0	124.6	2,179	7.94	1,332	M	
29	47.9	1,706	78.3	123.6	2,178	7.80	1,330	M	
30	47.7	1,693	77.7	122.1	2,178	7.53	1,274	M	

Mississippi River.—Red River Landing, La.

1851.									
March 31	*	.....	.....	.....	.....	.....	1,206	F	M = meter.
1881.									F = double floats.
Dec....14	30.3	1,500	40.0	58.0	3,747	4.42	662	F	R = rod floats.
16	28.8	1,471	39.4	59.2	3,736	4.37	643	F	
17	27.8	1,418	38.0	56.0	3,728	4.27	605	F	*Delta Survey gauge read 46.8 feet. See Humphreys & Abbot's Report on the Mississippi River, 1861, edition of 1876, pp. 381 and 520.
19	26.0	1,331	35.9	57.0	3,704	4.26	567	F	
22	23.6	1,237	33.5	53.1	3,691	3.96	490	F	
24	23.0	1,195	32.5	58.0	3,681	4.08	488	F	
27	24.6	1,258	34.0	55.3	3,697	4.15	522	R	
30	28.0	1,418	38.0	56.7	3,734	4.51	640	F	
31	29.0	1,462	39.2	56.1	3,731	4.30	629		Observations and reduction 1881-82 by Secretary M. R. C.
1882.									
Jan.... 3	31.6	1,596	42.6	62.1	3,749	4.52	721	F	Section was about 200 feet below the warehouse.
5	32.7	1,607	42.8	59.0	3,757	4.65	749	F	
19	36.6	1,758	46.8	66.5	3,753	5.45	958	F	
21	37.6	1,778	47.3	66.0	3,762	5.91	1,050	F	
23	37.9	1,765	47.2	68.0	3,735	5.72	1,010	F	Report on work, Report C. of E. 1884, p. 2636; tabulation, ibid. p. 2642.
24	38.2	1,798	47 7	68.4	3,771	5.59	1,005	F	
26	38.6	1,827	48.6	67 7	3,758	5 51	1,007	F	
28	39.1	1,881	49.9	67.5	3,771	5.71	1,074	F	All gauge readings at this station were taken on the U. S. Engineer standard gauge whose zero is 23.85 feet above the Cairo datum plane.
Feb.... 2	40 0	1,914	50.8	70.0	3,769	5.69	1,090	F	
4	40.5	1,950	51.7	69.0	3,774	6.09	1,188	F	
6	40.8	1,905	50.4	70.0	3,779	6.13	1,167	F	
7	40.9	1,955	51.6	69.0	3,785	6.22	1,217	F	
8	41.1	1,930	51.1	68.0	3,777	6.26	1,209	F	
9	41.3	1,963	51.9	69.0	3,781	5.36	1,053	M	
10	41.5	1,922	50.9	69.0	3,777	5.72	1,099	M&F	
11	41.6	1,943	51.4	70.0	3,783	5.61	1,090	F	
14	42.1	1,964	51.8	71.0	3,788	5.92	1,163	F	
15	42.2	1,971	52.2	70.5	3,780	5.90	1,162	F	
17	42.5	2,009	53.0	71.4	3,785	5.88	1,182	F	
18	42.6	2,041	53.9	71.8	3,786	5.75	1,173	F&R	
21	43.2	2,072	54.7	73 0	3,789	5.86	1,213	F	
22	43.3	2,098	55.4	72.5	3,791	5.70	1,197	F	
23	43.4	2,099	55.3	73.4	3,793	5.84	1,227	F	
24	43.6	2,094	54.6	71.5	3,831	5.77	1,207	F	
27	44.1	2,140	55.5	72.0	3,853	5.74	1,228	F	
28	44.3	2,173	56.4	72.0	3,853	5.69	1,237	F	
March 2	44.8	2,189	56.0	73.5	3,909	5.63	1,232	M	
3	45.1	2,192	56.2	74 0	3,899	5.69	1,247	M	
7	46.0	2,284	58.4	76.5	3,914	5.82	1,330	F	
8	46.2	2,296	58.7	76 0	3,914	5.81	1,335	F	
9	46.5	2,301	58.8	75.3	3,914	5.91	1,361	F	

MISSISSIPPI RIVER.—RED RIVER LANDING, LA.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
March. 10	46.8	2,302	58 8	76.8	3,914	6.07	1,397	F	M = meter.
11	46.9	2,310	59.2	77.2	3,904	5.94	1.371	F	F = double floats.
13	47.2	2,332	59.7	77.5	3,904	6.04	1,408	F	R = rod floats.
14	47.3	2,333	59.8	78.5	3,904	6.00	1,407	F	
15	47.4	2,336	59.6	78.5	3,918	6.28	1,467	F	
16	47.5	2,376	60.6	79.0	3,918	6.08	1,444	F	
17	47.6	2,378	60.7	79.0	3,918	6.17	1,468	F	
18	47.6	2,341	59.7	79.0	3,918	6.20	1,451	F	
20	47.8	2,346	59 9	79.0	3,918	6.00	1.408	F	
23	48.1	2,318	59.2	77.0	3,918	6.09	1,411	F	
24	48.2	2,343	59.8	78.0	3,918	6.29	1,474	F	
25	48.3	2,310	59.0	77.5	3,918	6.36	1,469	F	
27	48 5	2,345	59.8	79.0	3,918	6.22	1,459	F	
28	48.4	2,375	60.9	80.5	3,899	6.46	1,534	F	
29	48.4	2,374	60.9	80.2	3,899	6.48	1,539	F	
30	48.4	2,342	60.1	80.0	3,899	6.43	1,505	F	
31	48.3	2,354	60.4	80.5	3,899	6.78	1,595	F	
April.. 3	48.1	2,362	60.6	78.0	3,899	6.45	1,523	F	
4	48 0	2,354	60.4	77.0	3,899	6.06	1,427	F	
5	47.8	2,337	59.9	77.0	3,899	6.06	1,416	F	
6	47.7	2,344	60.1	77.5	3,899	6.34	1,485	F	
7	47.6	2,334	59.9	79.0	3,899	6.26	1,460	F	
8	47 4	2,362	60.6	78.5	3,899	5.98	1,412	F	
10	47.0	2,371	61.2	79.5	3,876	6.01	1,426	F	
12	47.0	2,372	61.2	78.7	3,876	6.33	1,502	F	
13	46.9	2,402	62.0	79.5	3,876	6.34	1,522	F	
14	46.8	2,422	62.5	80.0	3,876	6.67	1,471	F	
15	46.6	2,446	63.1	79.8	3,876	5.93	1,451	F	
17	46.3	2,453	63.3	79 8	3,876	5.55	1,361	F	
18	46.1	2,433	62.8	78.6	3,876	5.64	1,372	F	
19	46.0	2,448	63.2	79.7	3,876	5.51	1,348	F	
20	45.9	2,471	63.8	79.2	3,876	5.51	1 363	F	
21	45.8	2,473	63.9	80.0	3,871	5.52	1,364	F	
22	45.8	2,484	64.2	79.5	3,871	5.48	1,362	F	
24	45.6	2,475	63.9	78.7	3,871	5.52	1,365	F	
25	45.5	2,514	64.9	79.5	3,871	5.21	1,309	F	
26	45.4	2,502	64.6	78.6	3,871	5.27	1,317	F	
27	45.3	2,460	63.6	79.4	3,871	5 35	1,317	F	
28	45 1	2,454	63.4	79.3	3,871	5.36	1,315	F	
29	45.0	2,446	63.2	78.7	3,871	5.17	1,265	F	
May.... 1	44.7	2,396	61.9	79.0	3,871	5.20	1,247	M&F	
2	44.6	2,392	61.8	79.0	3,871	5.12	1,235	F	
3	44.3	2,376	61.4	79.0	3,871	5.08	1,208	F	
4	44.2	2,387	61.7	77.0	3,871	5.40	1,289	F	
5	44.1	2,384	61.6	77.2	3,871	5.16	1,230	F	
6	44.0	2,382	61.5	78.0	3,871	5.22	1,243	F	
8	43.9	2,382	61.5	78.0	3,871	5.04	1,202	F	
10	43.6	2,374	61.3	77.5	3,871	4.90	1,164	F	
11	43.3	2,365	62.7	76.3	3,774	4.84	1,145	F	
12	43.1	2,356	62.6	76.8	3,766	5.31	1,251	M	
13	42.9	2,342	62.2	76.3	3,766	4.97	1,164	M	
15	42.6	2,365	62.8	77.5	3,763	5.16	1,219	M	
16	42.5	2,358	62.6	78.0	3,763	5.01	1,181	M	
17	42.4	2,356	62.6	77.0	3,761	5.06	1,192	M	
18	42.2	2,366	62.9	76.5	3,761	5.12	1,210	M	
19	42.1	2,355	62.6	77.0	3,762	5.11	1,204	M	
20	41 9	2,342	62.3	76.7	3,762	5.02	1,175	M	
22	41.9	2,330	62.0	75.7	3,762	4.78	1,114	F	
23	41.8	2,322	61.7	75.4	3,761	5.01	1,164	M	
24	41.6	2,316	61.6	75.0	3,759	4.95	1,146	M	
25	41.5	2,313	61.5	75.2	3,759	4.94	1.142	M	
26	41.4	2,291	61 0	75.3	3,759	4.98	1,142	M	
27	41.4	2,308	61.4	75.0	3,758	5.00	1.155	M	
29	41.3	2,294	61.0	75.2	3,759	4 94	1,132	M	
31	41.4	2,314	61.6	75 2	3,759	4.92	1,138	M	

MISSISSIPPI RIVER.—RED RIVER LANDING, LA.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
June... 1	41.4	2,322	61.8	76.0	3,759	4.90	1,138	M	M = meter.
2	41.4	2,338	62.2	76.1	3,759	5.00	1,168	M	
3	41.4	2,331	62.0	75 5	3,759	4.88	1,125	M	
5	41.4	2,322	61.7	76.0	3,763	4 72	1,097	M	
6	41.5	2,335	62.0	74.6	3,765	4.77	1,114	M	
7	41.5	2,339	62.1	74.0	3,765	4.79	1,120	M	
8	41.6	2,324	61.7	72.7	3,767	4.81	1,117	M	
10	41.6	2,345	62.2	75 3	3,772	4.77	1,119	M	
12	41.7	2,338	62.0	75.0	3,768	4.74	1,107	M	
14	41.7	2,356	62 5	75.0	3,768	4.78	1,126	M	
15	41.8	2,363	62.7	75.5	3.769	4.72	1,115	M	
16	41.8	2,358	62 6	75.8	3,769	4.80	1,132	M	
17	41.8	2,340	62.1	75.7	3,769	4 90	1,148	M	
19	41.8	2,338	61 9	76.0	3,774	4.72	1,105	M	
20	41.8	2,344	62.1	76.0	3,774	4.67	1,094	M	
21	41.8	2,342	62.1	74.0	3,774	4.77	1,118	M	
23	41.8	2,340	61.9	73.3	3,778	4.80	1,123	M	
24	41.8	2,341	62.0	73.0	3,778	4 68	1,096	M	
26	41.8	2,352	62 3	73.4	3,778	4.67	1,099	M	
28	41.7	2,354	62.3	74.2	3.777	4.61	1,085	M	
30	41.6	2,341	62.0	75.0	3,776	4 73	1,106	M	
July... 1	41.5	2,328	61.6	75.0	3,776	4.68	1,089	M	
3	41.4	2,320	61.4	74.0	3,777	4 58	1,062	M	
4	41.3	2,326	61 6	73.2	3,777	4.57	1,063	M	
5	41.3	2,335	61.8	73.0	3,777	4.57	1,068	M	
7	41.1	2,332	61.7	73 0	3,777	4.54	1,060	M	
8	41.0	2,310	61.2	73.0	3,777	4.52	1,044	M	
10	41.0	2,340	62.0	74.5	3,777	4.44	1,039	M	
12	40 8	2,330	61.7	74.2	3,777	4.38	1,020	M	
13	40.8	2,337	61 9	75.0	3,776	4.40	1,029	M	
14	40.8	2,342	62.0	74.4	3,776	4.46	1,045	M	
15	40.7	2,318	61.4	75.0	3,776	4.49	1,041	M	
17	40.5	2,308	61.1	74.0	3,775	4.50	1,039	M	
19	40.4	2,313	61.4	75.0	3,767	4.42	1,022	M	
20	40.4	2,306	61.2	74.6	3,766	4.37	1,008	M	
21	40.3	2,315	61.5	74.5	3,765	4.45	1,029	M	
22	40.2	2,310	61.4	74.5	3,765	4.38	1,011	M	
24	40.2	2,310	61.4	75.0	3,765	4.35	1,005	M	
26	39.8	2,280	60.7	74.0	3,757	4.21	960	M	
28	39.5	2,246	59.8	72 2	3 756	4.18	940	M	
29	39.3	2,242	59 7	72.4	3,757	4.12	923	M	
31	38.7	2,210	58.8	73.0	3,757	4.10	907	M	
Aug.... 1	38 3	2,190	58.3	73 0	3,756	4.06	890	M	
2	37.9	2,168	57.7	72.0	3,756	3.78	820	M	
4	36.7	2,117	56.4	70.5	3,753	3.82	809	M	
5	35.9	2,094	55.8	71.4	3,751	3.68	771	M	
7	34.0	2,022	54.0	68 0	3,746	3.55	718	M	
8	32.8	1,994	53.3	67.3	3,742	3.47	691	M	
10	30.8	1,906	51.0	68.0	3,740	3.19	608	M	
12	28.8	1,826	48.9	65.4	3,733	3.07	561	M	
14	27.6	1,786	48.0	63.0	3,722	3.12	556	M	
15	27.3	1,775	47.7	62 5	3.724	3.15	559	M	
17	26.6	1,741	46 7	60.2	3,726	3.22	560	M	
18	26.2	1,724	46.3	61.3	3,726	2.95	508	M	
19	25.9	1,737	46.7	60 5	3,716	2.94	511	M	
21	25 2	1,666	44.9	59.0	3,711	2.93	488	M	
23	24.0	1,627	43.9	56.2	3.705	2.92	475	M	
24	23 4	1,596	43.1	56.0	3.699	2.98	475	M	
25	22.7	1,552	42.0	54.8	3,698	2.83	439	M	
26	22.1	1,560	42.2	51 5	3,696	2.89	450	M	
28	21.3	1,519	41.1	52.0	3,695	2 90	438	M	
29	20.8	1,499	40.6	50.8	3,695	2.79	419	M	
31	19 6	1,458	39.5	49.0	3,691	2.74	399	M	
Sept.... 2	18.4	1,403	38.1	47.5	3,684	2.62	367	M	
4	17.2	1,363	37.1	45.8	3,678	2 64	360	M	

Mississippi River.—Red River Landing, La.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	100sq.ft	feet.	feet.	feet.	feet.	1000 cu.ft.		
Sept.... 5	16.2	1,344	36.6	46 0	3,676	2.64	355	M	M = meter.
7	15.6	1,292	35 2	45.0	3,668	2.59	334	M	
8	15.3	1,282	35 0	44 6	3,668	2 56	329	M	
11	14 5	1,240	33.9	43.5	3,657	2.46	305	M	
12	14 2	1,222	33.4	43.0	3,656	2.54	310	M	
13	14 0	1,218	33.3	42.6	3,657	2.53	308	M	
15	14.0	1,220	33.4	42.7	3,657	2.45	299	M	
16	14.0	1,211	33.1	43 0	3,657	2.50	303	M	
18	13.8	1,199	32.1	42.6	3,658	2.46	295	M	
19	13.7	1,203	33.0	41.9	3,649	2.46	296	M	
20	13.5	1,196	32.8	42.3	3,651	2.50	300	M	
23	12.7	1,149	31.5	42.0	3,646	2.46	282	M	
25	12.8	1,153	31.6	42.0	3,645	2.47	285	M	
26	13.2	1,173	32.2	42.0	3,646	2.51	296	M	
29	14.1	1,222	33.4	43.0	3,658	2.61	319	M	
30	14.4	1,222	33.4	43.8	3,660	2.46	300	M	
Oct.... 3	13.4	1,195	32.7	43.8	3,651	2.39	288	M	
4	12.9	1,176	32.2	42.0	3,650	2.32	273	M	
5	12.3	1,153	31.6	42.0	3,648	2.30	265	M	
6	11.7	1,125	30.9	41.5	3,644	2.28	257	M	
7	11.1	1,098	30.2	41.0	3,640	2.30	252	M	
9	10.3	1,079	29.7	40.0	3,636	2.18	234	M	
10	9.8	1,057	29.1	40.0	3,631	2.14	227	M	
11	9.6	1,066	29.4	40.0	3,631	2.16	230	M	
13	9.4	1,019	28.9	39.0	3,631	2.14	225	M	
14	9.4	1,040	28.6	39.0	3,637	2.23	232	M	
16	9.2	1,019	28.0	38.0	3,635	2.20	224	M	
17	9.2	1 020	28.1	38.0	3,635	2.30	234	M	
21	9.4	1,016	27.9	39.5	3,635	2.22	226	M	
23	9 6	1,036	28.5	39.8	3,635	2.40	248	M	
25	9.9	1.107	30.4	42 6	3,638	2.37	262	M	
26	10.2	1,028	28.2	39 4	3,639	2.44	251	M	
27	10.4	1,018	28.0	40.4	3,642	2.47	252	M	
28	10.6	1,043	28.6	40.7	3,642	2.44	255	M	
30	10.5	1,031	28.3	40.2	3,641	2.42	251	M	
Nov.... 1	10.4	1,034	28 4	40.3	3,640	2.53	262	M	
3	9.9	1,013	27 8	40.0	3,640	2.41	244	M	
4	9.8	987	27.1	39.8	3,640	2.45	242	M	
6	9.7	992	27.3	38.0	3,635	2 42	241	M	
7	9.7	999	27.5	39.0	3,635	2 42	241	M	
8	9.7	1,018	28 0	40 5	3,635	2.46	251	M	Observation March 21 by "Patrol" party under Secretary M. R. C. Results in Report C. of E. 1885, p. 2650.
10	9.7	1,020	28.1	41.0	3,635	2.50	255	M	
11	9.8	1,017	28.0	41.0	3,637	2.38	242	M	
14	10.3	1,055	29.0	40.5	3,645	2.47	261	M	
15	10.4	1,0.0	28.8	40.0	3,645	2.45	257	M	
17	10.7	1,046	28.7	41.5	3,650	2.57	269	M	
20	11.8	1,083	29.6	41 2	3,653	2.65	287	M	
21	12.2	1,113	30.5	42.4	3,653	2 63	292	M	
22	12.6	1,123	30 7	42.0	3,658	2.72	305	M	
23	12 9	1,129	30.8	43.0	3,661	2.76	302	M	
1884.									
March. 21	46.0	2,283	.....	.....	.....	5.66	1,292	M	Report on observations, and tabulation, Report C. of E. 1887, pp. 2846 and 2-52.
Oct.... 6	8.2	989	27.8	43 0	3,564	2.53	250	M	
7	9.5	1,085	30.4	46 0	3,568	2.48	269	M	
8	10 9	1,108	30.9	47.0	3,582	2 63	291	M	
9	12 7	1,237	34.4	49.0	3,594	2.75	340	M	
10	13.6	1,254	34.8	51.0	3,605	2 67	335	M	Section 100 feet below that of 1881-2.
11	14 6	1,229	34.1	51.0	3,609	2.75	339	M	This section was used with only a small change until 1892 inclusive.
13	16.1	1,292	35.7	50 4	3,617	2.95	382	M	
15	16 8	1,282	35.4	51.5	3,620	3.08	395	M	
16	16.7	1,310	36.2	54 0	3,620	3 07	402	M	
17	16.4	1,303	36 0	51.0	3,619	2.98	388	M	Observations and reduction under Secretary M. R. C.
18	16.0	1,278	35.3	51.0	3,617	2.93	374	M	
20	15.5	1,240	34.3	50 0	3,614	2.96	367	M	
21	15.3	1,266	35.0	52.2	3,614	2.98	377	M	
22	15.4	1,245	34 4	50.0	3,614	2.96	368	M	
24	15.4	1,252	34.6	49.0	3,615	2.92	366	M	

MISSISSIPPI RIVER.—RED RIVER LANDING, LA.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1884.	feet.	100sq.ft	feet.	feet.	feet.	feet.	1000 cu.ft.		
Oct....25	15.4	1,264	35.0	52.0	3,615	2.92	369	M	M = meter.
28	15.2	1,270	35 2	52.2	3,613	2.87	365	M	
30	14.6	1,255	34 8	51 5	3,610	2.78	348	M	
31	14.2	1,241	34.4	50.5	3,604	2.84	353	M	
Nov.... 1	14.0	1,282	35.6	52.1	3,605	2.80	359	M	
4	13.8	1,265	35.1	51.2	3,604	2.79	353	M	
5	13.9	1,248	34.6	51.9	3,604	2.75	343	M	
6	13.9	1,248	34 6	50.9	3,605	2.76	344	M	
7	13.8	1,219	33.8	49.0	3,605	2.75	335	M	
8	13.7	1,230	34.1	50 2	3,605	2.71	333	M	
10	13.4	1,211	33.6	50.2	3,599	2.66	323	M	
11	13.1	1,188	33.0	48.1	3,600	2 67	317	M	
12	12.8	1,174	32.7	48.0	3,596	2.72	320	M	
13	12.4	1,154	32.1	47.2	3,590	2 62	303	M	
14	12.0	1,139	31.8	47 1	3,585	2.64	301	M	
15	11.5	1,133	31.6	47.5	3,584	2.55	289	M	
17	10.6	1,109	31.0	46.0	3,578	2 61	289	M	
18	10.2	1,083	30.3	44.5	3,569	2.61	282	M	
19	9.7	1,076	30.2	45.0	3,569	2.43	261	M	
20	9.3	1,046	29.3	44.0	3,567	2.49	260	M	
21	9.0	1,033	29.0	44 2	3,566	2.50	259	M	
24	8.4	1,013	28.4	43.6	3,563	2.43	247	M	
25	8.2	1,004	28.2	43 0	3,561	2.38	239	M	
26	8.0	990	27.8	42.5	3,560	2.33	230	M	
28	7.9	1,000	28.1	42.5	3,559	2.25	225	M	
29	7.8	976	27.4	40.3	3,559	2.35	229	M	
Dec.... 1	7.5	988	27.8	41.9	3,555	2.40	237	M	
2	7.5	986	27.7	42.0	3,556	2.38	235	M	
3	7.7	984	27.7	42.2	3,558	2.36	232	M	
4	8.1	1,016	28.5	43.0	3,560	2.50	254	M	
6	9.6	1,032	29.4	44.0	3,574	2.44	257	M	
8	10.0	1,071	29.9	45.5	3,578	2.46	264	M	
9	10.0	1,070	29.9	45.1	3,578	2.42	259	M	
10	9.8	1,057	29.5	45.2	3,578	2 47	262	M	
12	9.4	1,035	28.9	45.0	3,576	2.48	256	M	
13	8.7	1,024	28.6	44.5	3,574	2.34	239	M	
16	8.0	1,002	28.2	44.0	3,558	2.34	234	M	
19	8.8	1,020	28.6	44.0	3,569	2 46	251	M	
20	10.0	1,072	29.9	45.5	3,576	2.72	291	M	
22	13.2	1,181	32.8	47.0	3,605	2.81	332	M	
23	14.4	1,220	33.8	49.5	3,611	2.76	336	M	
24	15.2	1,258	34.8	48.4	3,617	2.88	362	M	
26	16.0	1,283	35.4	51.2	3,625	2.73	350	M	
30	18.4	1,367	37.5	52.5	3,643	3 08	421	M	
31	19.6	1,412	38.7	55.0	3,646	3.18	449	M	
1885.									
Jan.... 2	21.2	1,459	39 9	57.0	3,660	3 32	484	M	
3	22.9	1,537	41.9	58.0	3,667	3 40	522	M	
7	31.4	1,967	52.4	69.5	3,758	.....	.....		
8	32.8	2,022	53.7	73.0	3,761	4.09	826	M	
9	34.1	2,044	54.2	75 0	3,770	4.07	832	M	
10	35.1	2,097	55.6	75.1	3,772	4.27	896	M	
12	36.6	2,171	57.5	77 0	3,778	.....	.....		
13	37.2	2,182	57.7	77.0	3,781	4.45	971	M	
16	38.8	2,273	60.0	81.0	3,790	.....	.....		
17	39.1	2,257	59.6	80.0	3,791	4.64	1,048	M	
19	39.7	2,242	59.1	79.5	3,792	4.78	1,073	M	
21	40.2	2,267	59 8	81 0	3,793	4.86	1,101	M	
22	40.5	2,282	60.1	80.5	3,794	4.95	1,130	M	
26	41.5	2,293	60.1	82.5	3,815	4.88	1,120	M	
27	41.7	2,328	61.0	82.0	3,817	4.87	1,134	M	
29	41.8	2,287	59.9	79.0	3,819	4.93	1,127	M	
30	41 9	2,306	60.4	7..2	3,819	5.08	1,171	M	
Feb.... 2	42.1	2,286	59.8	87.0	3,821	4 95	1,132	M	
4	42.1	2,325	60.8	85.5	3,821	5.04	1,171	M	
5	42.1	2,367	61.9	95.5	3,822	4 95	1,173	M	

MISSISSIPPI RIVER.—RED RIVER LANDING, LA.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1885.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Feb.... 6	42.1	2,322	60.8	87.0	3,822	4 90	1,137	M	M = meter.
7	42.0	2,323	60.8	84.5	3,822	4.87	1,130	M	
9	41.6	2,299	60.2	84.5	3,818	.....	.....		
10	41.4	2,353	61.7	92.0	3,816	4.73	1,113	M	
11	41.0	2,290	60.2	89 0	3,804	4.56	1,043	M	
12	40.6	2,296	60.4	87.0	3,800	4.59	1,058	M	
14	39.8	2,236	59.0	86.0	3,792	4 38	979	M	
16	39 0	2,230	58.8	86.5	3,792	4.23	943	M	
17	38 6	2,205	58.2	87.0	3,788	4.37	964	M	
19	37.9	2,123	56.0	86.0	3,788	4 17	886	M	
20	37.7	2,165	57.2	84 5	3,787	4.09	884	M	
21	37.4	2,154	56.9	84 0	3,786	4.04	871	M	
24	37.0	2,123	56.1	86.5	3,784	4.10	870	M	
25	36.9	2,125	56.2	84.0	3,782	4 06	863	M	
27	36.1	2,098	55.6	83.1	3,774	3.88	815	M	
28	35.5	2,073	55.0	80.9	3,770	3.83	793	M	
March. 2	34.1	2,011	53 4	81.1	3,769	3.62	729	M	
3	33.2	1,984	52.7	79.5	3,767	3.56	705	M	
5	31.5	1,905	50.6	79.1	3,763	3.48	663	M	
6	30.6	1,894	50.4	79.0	3,759	3.37	638	M	
7	30 0	1,858	49.5	77.0	3,756	3.44	638	M	
9	29 0	1,792	47.8	75.0	3,753	3.44	617	M	
11	28.6	1,786	47.7	78.0	3,741	3.50	625	M	
13	28.9	1,762	47.1	77.5	3,743	3.52	621	M	
14	29.2	1,797	48.0	74.1	3,748	3.47	623	M	
18	31.5	1,899	50.4	76.5	3,768	3.77	715	M	
19	32.0	1,956	51.9	79.0	3,771	3.80	743	M	
20	32.4	1,980	52.5	79.0	3,771	3.83	758	M	
21	33.1	2,013	53.1	80.5	3,772	3.84	769	M	
23	34.0	2,023	53 6	82.5	3,774	3.85	778	M	
24	34.3	2,033	53.8	84.1	3,775	4 08	829	M	
30	35.4	2,049	54.2	84.5	3,777	3.93	806	M	
1889.									
Jan.... 10	19 5	1,122	29.7	50.2	3,780	3.84	431	M	Section same as in 1884-85.
11	19.4	1,119	29.6	49.5	3,780	3.95	442	M	
12	19.2	1,138	30 1	53.0	3,775	3.79	431	M	
14	18.9	1,141	30.3	52 6	3,770	3 85	439	M	Report on observations and tabulation Report C. of E. 1891, p. 3516.
16	19.9	1,164	30.8	52 4	3,780	3.71	432	M	
18	22.3	1,304	34.4	56.0	3,790	4.15	541	M	
19	23 6	1,367	36.0	58 0	3,795	4.38	599	M	
27	31.8	1,701	44.2	66.8	3,852	4.69	797	M	Observations 1889 to 1893 taken under M. R C. fourth district officer. Reduction in Secretary's office.
28	32 3	1,716	44.5	68.1	3,857	4.76	817	M	
29	32.6	1,724	44.6	66.8	3,865	4.77	823	M	
30	32.8	1,761	45 5	70.2	3,870	4 69	826	M	
Feb ... 1	33.2	1,750	45 1	69 8	3,878	4.36	762	M	
2	33 1	1,789	46.2	70 2	3 875	4.52	809	M	
6	33 0	1,733	44.7	73.8	3,874	4.50	779	M	
7	33.1	1,706	44.0	72.8	3,875	4.33	739	M	
9	33.3	1,752	45.2	69.6	3,878	4.31	756	M	
13	33.5	1,778	45.8	70.4	3,881	4.30	764	M	
14	33.4	1,764	45.5	70.5	3,879	4.34	765	M	
16	32 8	1,767	45.7	70.1	3.865	4.23	748	M	
18	31.6	1,747	45.3	69 8	3,853	4.02	702	M	
20	29.9	1,662	43 3	66.5	3,839	3.94	655	M	
21	29.0	1,619	42.2	65.4	3,854	3.80	616	M	
23	27.0	1,551	40 6	64 9	3,819	3.60	558	M	
25	25.3	1,482	38.9	63.1	3,812	3.82	566	M	
28	26 6	1,522	39 8	64.1	3,820	3.99	608	M	
March. 4	31.2	1,701	44.2	68.6	3,850	4 13	702	M	
5	31 8	1,737	45.0	69.8	3,860	4.14	718	M	
6	32.3	1,761	45.6	70.5	3,863	4.25	748	M	
8	33.1	1,789	46.1	70.7	3,877	4.26	762	M	
9	33.4	1,813	46.8	71.8	3,877	4.16	754	M	
13	34.0	1,837	47.2	72 4	3,888	4.35	798	M	
14	33.9	1,805	46.4	72 3	3,888	4.22	762	M	
19	32.5	1,732	44.8	68.9	3,862	4.13	715	M	
21	31.5	1,724	44.8	68.3	3,841	3.99	688	M	
23	30.5	1,690	44.0	68.6	3,839	3.91	660	M	

Mississippi River.—Red River Landing, La.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n, in 100 sq. ft.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	DISCHARGE PER SECOND IN 1000 CUBIC FEET. River.	Bank.	Total.	Method.	REMARKS.
1889.	feet.		feet.	feet.	feet.	feet.					
March. 25	29.6	1,653	43.1	68.3	3,858	3.88	641	.....	.....	M	
28	28.3	1,565	40.9	65.6	3,827	3.94	616	.....	.....	M	
30	28.0	1,547	40 5	63.8	3,824	4.09	618	.....	.....	M	
April.. 3	29.9	1,634	42.5	67.0	3,842	4.18	682	.....	.....	M	
5	30.5	1,656	43.0	66.3	3,848	4.12	682	.....	.....	M	
6	30.6	1,661	43.2	67.3	3,849	4.08	678	.....	.....	M	
8	30.4	1,6 3	42.9	67.3	3,849	4.08	675	.....	.....	M	
10	29 9	1,640	42.8	67.7	3 847	4.02	662	.....	.....	M	
11	29.6	1,626	42.3	67.7	3,846	4.10	666	.....	.....	M	
15	28.8	1,593	41.5	67.5	3,838	4.00	638	.....	.....	M	
17	28.4	1,578	41 2	65.9	3,829	3.96	625	.....	.....	M	
18	28.0	1,562	40.8	65.7	3,826	3.90	610	.....	.....	M	
20	27.2	1,542	40.4	65 6	3,820	3 87	597	.....	.....	M	
22	26.3	1,502	39.3	63.7	3,818	3 86	580	.....	.....	M	
24	25.4	1,477	38 8	63.9	3,809	3.74	552	.....	.....	M	
25	25.1	1,465	38.5	61.5	3,808	3.78	553	.....	.....	M	
27	24.8	1,465	38.5	62.5	3,810	3.81	558	.....	.....	M	
May... 13	19.2	1,246	33.1	56 8	3,768	3.61	449	.....	.....	M	
15	17.6	1,189	31.6	56.0	3,764	3.64	432	.....	.....	M	
16	17.0	1,172	31 2	55.7	3,757	3.91	458	.....	.....	M	
18	16.4	1,136	30 3	54.0	3,754	3.57	405	.....	.....	M	
20	15.9	1,109	29.6	53 8	3,749	3 59	398	.....	.....	M	
22	15.2	1,097	29.3	52 1	3,740	3.54	388	.....	.....	M	
23	14.8	1,069	28.6	51.0	3,736	3.49	374	.....	.....	M	
25	14.0	1,034	27.7	49.9	3,730	3 51	363	.....	.....	M	
27	13.7	1,019	27.3	50.0	3,728	3.53	360	.....	.....	M	
29	13.8	1,008	27.0	51.0	3,728	3.61	364	.....	.....	M	
1890.											
Feb... 22	41.8	1,963	50.2	79.4	3,915	5.25	1,031	.....	.....	M	
23	41.8	1,960	50.1	.....	3,915	5.18	1,016	.....	.....	M	
24	41.9	1,954	49.9	79.7	3,915	5 25	1,026	.....	.....	M	
26	42.3	1,986	50.7	79.2	3,915	5.16	1,024	.....	.....	M	
27	42.3	1,979	50.6	.....	3,915	5.15	1,023	.....	.....	M	
28	42.6	1,979	50 5	80.2	3,920	5.24	1,037	.....	.....	M	
March. 3	42.6	2,015	51.4	80.0	3,920	5.18	1,013	.....	.....	M	
18	44.9	2,091	53.1	81.5	3,935	5.42	1,134	.....	.....	M	
28	44.8	2,105	52.8	80 8	3,989	5.29	1,114	4	1,117	M	
April.. 1	44.9	2,139	53.6	81.7	3,989	5.22	1,117	4	1,121	M	
8	46.0	2,166	54.3	83.6	3,990	5.45	1,181	4	1,185	M	
12	46.7	2,174	54 0	81.9	4,024	5.59	1,215	4	1,218	M	
16	47.4	2,189	54 4	82.5	4,025	5.70	1,247	13	1,260	M	
18	47.8	2,210	54.9	82 5	4,025	5.76	1,273	10	1,288	M	
May.. 1	47.4	2,314	57.5	77.2	4,025	6.09	1,408	10	1,418	M	
7	47.2	2,325	57.8	82.3	4,025	6.19	1,439	13	1,453	M	
10	46.9	2,342	58 2	80.1	4,023	5.79	1,356	9	1 365	M	
13	46.6	2,281	56.7	79 5	4,022	5 88	1,340	11	1.351	M	
15	46.5	2,353	58.0	82.4	4,022	5.77	1,316	10	1 356	M	
20	46 0	2,262	57.3	82.4	3,950	5.74	1,298	6	1 304	M	
1891.											
March 10	43 2	2,108	52.8	81.5	3.991	5.13	1,082	2	1,084	M	
16	44.5	2,098	52.5	81.1	3,993	5.24	1,098	2	1,100	M	
18	44.8	2,101	52.6	82.7	3.993	5.23	1,100	2	1.102	M	
20	45.0	2.117	53.0	82 8	3.993	5.23	1,107	2	1,109	M	
24	45.0	2,135	53.5	79.1	3,993	5.29	1,130	3	1,132	M	
27	45.0	2,110	52 8	80.7	3,993	5.36	1 131	3	1,134	M	
April.. 2	45.2	2,134	53.4	84.2	3,994	5.32	1,136	3	1,139	M	
7	45.2	2,112	52 9	79.9	3,994	5.34	1,128	3	1,131	M	
10	45.4	2,169	54.3	82 3	3,994	5.14	1,116	3	1,118	M	
13	45.5	2,192	54.9	82.1	3,995	5.12	1,122	3	1,125	M	
16	45.4	2,182	54.6	82.3	3,995	5.08	1,109	3	1.112	M	
20	45.4	2,227	55.7	83.3	3,995	4 93	1,098	3	1,100	M	
Oct.... 15	2.1	540	15.7	37.7	3,446	2.91	157	.....	.....	M	
16	2.0	545	15 8	42.3	3.446	2.74	149	.....	.....	M	
17	1.9	524	15 2	37 8	3,446	2 72	143	.....	.....	M	
Nov.... 21	1 9	538	15.6	42.6	3,442	2.63	141	.....	.....	M	
22	3.0	551	16.0	44 0	3,445	2 78	153	.....	.....	M	

Tabulation of 1891, Report C. of E. 1892, p. 3215. Section of 1890 same as in 1884-85. Tabulation in Report C. of E. 1891, p. 3339. M = meter.
Report on work, ibid. p. 3125.
The discharge over bank is on line of discharge section and partly around the end of an old levee on the right bank. The field notes of this overflow are very incomplete, hence these results are not exact.

MISSISSIPPI RIVER.—RED RIVER LANDING, LA.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n, in 100 sq. ft.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	DISCHARGE PER SECOND IN 1000 CUBIC FEET. River.	Bank.	Total.	Method.	REMARKS.
1892.	feet.		feet.	feet.	feet.	feet.					
April.. 3	33.5	1,662	42 3	78.5	3,934	4 42	735	.....	.....	M	
5	34.2	1,687	42.9	78.9	3,934	4.62	779	.....	.....	M	
7	35.0	1.712	43.5	80.9	3,937	4.70	805	.....	.....	M	
21	40.8	1,926	48 6	85.0	3,965	5.20	1,002	.....	.....	M	
May.... 4	43 8	1,996	50 1	87.5	3,981	5.42	1,082	.....	.....	M	
6	44.1	2,017	50.7	86.8	3,981	5.41	1,092	.....	.....	M	
11	44 8	2,059	51.7	87.7	3,982	5.42	1,117	.....	.....	M	
19	45.4	2,076	51 4	86 2	4,040	5.44	1,130	2	1,132	M	
21	45.4	2,084	51.6	87.0	4,040	5.43	1,132	3	1,135	M	
23	45.4	2,088	51.7	89.6	4,040	5.34	1,115	4	1,119	M	M = meter F = double floats.
25	45.5	2,104	52.1	88.7	4,041	5.40	1,137	6	1,142	M	
27	45.6	2,117	52.4	88 1	4,041	5.38	1,140	6	1,146	M	
June... 1	46.0	2,129	52.7	88.6	4,042	5.40	1,149	6	1,155	M	
3	46.1	2,113	52.3	87.4	4,043	5.37	1,135	7	1,141	M	
7	46.5	2,141	52 9	86.6	4,044	5.38	1,152	7	1,159	M	
9	46.7	2,197	54.3	88.2	4,044	5.32	1,170	7	1,177	M	
11	47.0	2,224	55 0	87 7	4,044	5.31	1.181	7	1,188	M	
14	47.4	2,265	56 0	88.9	4,044	5.36	1,213	8	1,221	M	
16	47 7	2,297	56.8	89.2	4,044	5.45	1,252	8	1,260	M	
20	48 2	2,296	56 8	89 6	4,045	5.57	1,279	9	1,288	M	
23	48.6	2,314	57.2	90.0	4,045	5.64	1,304	8	1,312	M	
25	48.7	2,297	56 8	91.0	4,045	5.77	1,325	9	1,334	M	
27	48.8	2,286	56.5	91.0	4,046	5.78	1,321	10	1,331	M	
1893.											
May....23	44.2	1,993	49.4	72.3	4,038	5.32	1,060	5	1,065	M	
24	44.3	2,079	51.5	80 8	4,038	5.27	1,095	5	1,100	M	
26	44.4	2,082	51.6	79.6	4,038	5.20	1,084	5	1,089	M	
29	44 5	2,082	51.6	81 1	4,038	5.11	1,065	5	1,070	M	
June... 1	44.5	2,082	51 5	82 0	4,039	5 07	1,055	5	1,060	M	
3	44.6	2,186	54 0	80.0	4,044	4.83	1,056	5	1,061	M	
7	45.0	2,212	54.7	81.1	4,044	4 90	1,084	5	1,089	M	
9	45.2	2,218	54.8	82.0	4,044	5.07	1,124	5	1,129	M	
13	45.7	2,288	56.6	81 8	4.044	5.06	1,157	5	1,162	M	
17	46.5	2,241	55.3	82.7	4,050	5.19	1,164	5	1,169	M	
22	47.4	2.296	56.8	81.0	4,044	5.33	1,225	5	1,230	M	
24	47.6	2,278	56.3	83.5	4,044	5.08	1,157	6	1,163	M	
27	47.7	2,280	56.4	83 3	4,044	5.14	1,172	6	1,177	M	
July...10	43.1	2,059	51.0	76.7	4,038	4.72	973	5	977	M	
May....24	44 3	2,310	50.4	58.7	4,585	4.60	1,063	.....	.....	M	
26	44.4	2,275	49.6	56.9	4,585	4.85	1,103	.....	.....	M	
29	44.5	2,342	51.2	62.6	4,573	4.65	1,088	.....	.....	M	
June... 3	44.6	2,402	52.4	60 6	4,580	4 61	1,107	.....	.....	M	
7	45.0	2,400	52.4	61.2	4,580	4.60	1,105	.....	.....	M	
9	45.2	2,438	53.2	67.1	4,580	4.82	1,174	.....	.....	M	
13	45 8	2,516	54.9	63.9	4,580	4.80	1,208	.....	.....	M	
17	46.5	2,526	55.1	66.0	4,580	4.81	1,215	.....	.....	M	
20	47 1	2,560	55.7	65.4	4,580	4.80	1,225	1	1,226	M	
24	47.7	2,600	56.8	63 9	4,580	4.56	1,185	1	1,186	M	*
26	47.7	2,623	57.3	66.5	4,580	4.67	1,225	1	1,226	M	
27	47.7	2,634	57.5	66 1	4,580	4.60	1,213	1	1,214	M	
29	47.6	2,593	56 6	65.4	4,580	a 4 42	1,146	1	1,147	F	
29	47.6	2,593	56.6	65.4	4,580	b 4.76	1,235	1	1,236	F	
July... 1	47.2	2,590	56.5	64.4	4,580	c 4.40	1,141	1	1,141	F	
	.....	.....	.....	.....	.....	d 4.60	1,192	.....	.....	F	
9	43.8	2,414	52 7	59.7	4,580	4 23	1,021	.....	.....	M	
10	43.0	2,375	52.0	58.6	4,570	4 20	997	.....	.....	M	

Section of 1892 approximately the same as in former years. Tabulation, Report C. of E. 1893, p. 3691. Report on work, ibid. p. 3679.

Report on observations of 1893, Report C. of E. 1894, p. 2837. Report on work, ibid. p. 2823.

* Section at Torras Landing, ½ mile above Red River Landing.

a Surface floats reduced to mean of vertical.

b Floats at ⅝ depth reduced to mean of vertical.

c Floats at mid-depth reduced to mean of vertical.

d As observed at mid-depth.

Mississippi River.—Carrollton, La.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1851.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Feb....20	9.1	.....	.....	.....	.....	4.04	691		F = double floats.
21	10.1	.....	.....	.....	.....	4.41	768		
22	11.0	.....	.....	.....	.....	4.66	820		Results of 1851-2 taken from Humphreys and Abbott's Report on the Mississippi River, 1861, edition of 1876, p. 591.
24	11.8	.....	.....	.....	.....	5 04	894		
25	12.1	.....	.....	.....	.....	5.11	910		
26	12.5	.....	.....	.....	.....	5 24	939		
March.. 1	13.3	.....	.....	.....	.....	5.57	1,013		
3	13 6	.....	.....	.....	.....	5.60	1.020		
4	13.7	.....	.....	.....	.....	5.71	1,042		
5	13.9	.....	.....	.....	.....	5.74	1,050		The days on which less than half the velocities were observed have been omitted.
6	14.2	.....	.....	.....	.....	5.70	1,048		
8	14.1	.....	.....	.....	.....	5.82	1,068		
10	14.3	.....	.....	.....	.....	5.86	1,077		
11	14.3	.....	.....	.....	.....	5.96	1,098		
12	14.3	.....	.....	.....	.....	5.87	1,078		The H. & A., gauge was at same elevation as present U.S. Engineer gauge at Carrollton as near as can now be determined; the zero of this gauge is 20 91 feet above the Cairo datum plane and all gauge readings refer to this gauge.
13	14.4	.....	.....	.....	.....	5.94	1,094		
14	14.6	.....	.....	.....	.....	6.04	1,116		
17	14.8	.....	.....	.....	.....	6 22	1,153		
19	14.9	.....	.....	.....	.....	6.13	1,137		
20	14.9	.....	.....	.....	.....	6.20	1,149		
21	15.1	.....	.....	.....	.....	6 13	1,140		
22	15.2	.....	.....	.....	.....	6.02	1,122		
25	15.2	.....	.....	.....	.....	5 90	1,099		
28	15.4	.....	.....	.....	.....	5.96	1,113		
31	15.3	.....	.....	.....	.....	5.97	1,113		
April.. 2	15.3	.....	.....	.....	.....	5.99	1,118		
3	15.2	.....	.....	.....	.....	5 94	1,107		
*11	15.0	.....	.....	.....	.....	4.64	1,048		* Preston section.
12	15 1	.....	.....	.....	.....	5 64	1,048		
*18	14.7	.....	.....	.....	.....	4.69	1,056		
22	14 6	.....	.....	.....	.....	5.55	1,026		
May.... 5	13.7	.....	.....	.....	.....	5.10	932		
7	13.3	.....	.....	.....	.....	5.00	908	F	
9	13.0	.....	.....	.....	.....	4.90	884		
*12	12.3	.....	.....	.....	.....	3.87	849		
16	11.2	.....	.....	.....	.....	4.39	775		
17	11.0	.....	.....	.....	.....	4.37	769		
†20	10.6	.....	.....	.....	.....	3.66	719		† Locks Section.
21	10.4	.....	.....	.....	.....	4 01	701		
‡23	10.1	.....	.....	.....	.....	3.94	682		‡ Race Course section.
June... 5	11.1	.....	.....	.....	.....	4.09	720		
10	11.2	.....	.....	.....	.....	4.13	730		
16	11.7	.....	.....	.....	.....	4.41	783		
17	11.4	.....	.....	.....	.....	4.33	765		
20	11.8	.....	.....	.....	.....	4.47	794		
24	12 0	.....	.....	.....	.....	4.28	763		
27	12.0	.....	.....	.....	.....	4.34	773		
July... 2	12.2	.....	.....	.....	.....	4.51	805		
3	12.1	.....	.....	.....	.....	4.54	810		
5	12.2	.....	.....	.....	.....	4.58	819		
10	12.2	.....	.....	.....	.....	4.79	856		
16	12.5	.....	.....	.....	.....	4.76	854		
18	12.5	.....	.....	.....	.....	4.77	856		
26	12.7	.....	.....	.....	.....	4.82	869		
29	12.5	.....	.....	.....	.....	4.70	844		
Aug.... 2	12.5	.....	.....	.....	.....	4.78	859		
5	12.3	.....	.....	.....	.....	4.85	869		
7	11.9	.....	.....	.....	.....	4.69	835		
9	11.6	.....	.....	.....	.....	4.53	805		
11	11.1	.....	.....	.....	.....	4.37	770		
13	10.4	.....	.....	.....	.....	4.10	716		
15	9.7	.....	.....	.....	.....	3.87	669		
19	8 5	.....	.....	.....	.....	3 64	616		
20	8.4	.....	.....	.....	.....	3.66	620		
22	8.3	.....	.....	.....	.....	3 64	606		

Mississippi River.—Carrollton, La.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1851.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Aug....25	8.1	.....	.....	.....	.....	3.39	572		F = double floats.
27	8.0	.....	.....	.....	.....	3.42	576		
29	7 9	.....	.....	.....	.....	3.36	564		
Sept.... 1	7.2	.....	.....	.....	.....	3.30	549		
3	6.6	.....	.....	.....	.....	3.15	521		
5	6.2	.....	.....	.....	.....	3.16	519		
8	5.5	.....	.....	.....	.....	2.95	480		
10	5.2	.....	.....	.....	.....	2.97	481		
12	4.9	.....	.....	.....	.....	2.90	468		
17	4.1	.....	.....	.....	.....	2.52	401		
18	3.7	.....	.....	.....	.....	2.42	383		
19	3.4	.....	.....	.....	.....	2.36	372		
22	2 9	.....	.....	.....	.....	2.18	342		
30	1.2	.....	.....	.....	.....	1.74	265		
Oct.... 2	1 5	.....	.....	.....	.....	1.61	246		
4	1.3	.....	.....	.....	.....	1.60	246		
7	1.7	.....	.....	.....	.....	1.64	252		
9	1.7	.....	.....	.....	.....	1.66	255		
11	1.8	.....	.....	.....	.....	1.83	281		
17	1.6	.....	.....	.....	.....	1.64	251		
*20	1.6	.....	.....	.....	.....	1.42	275		* Preston section.
†21	1.6	.....	.....	.....	.....	1.47	258		† Locks section
23	1.4	.....	.....	.....	.....	1.76	270		
25	1 4	.....	.....	.....	.....	1.80	276		
Nov.... 4	1.3	.....	.....	.....	.....	1.70	259		
7	1.0	.....	.....	.....	.....	1.75	266		
10	1 2	.....	.....	.....	.....	1.75	267		
15	1.7	.....	.....	.....	.....	1.79	276		
18	1.3	.....	.....	.....	.....	1.58	241		
26	0.4	.....	.....	.....	.....	1.51	228		
Dec.... 2	0.8	.....	.....	.....	.....	1.69	257		
10	0.9	.....	.....	.....	.....	1.93	293		
19	0.5	.....	.....	.....	.....	1.92	275	F	
24	1.0	.....	.....	.....	.....	1.99	302		
31	1.8	.....	.....	.....	.....	2.14	330		
1852.									
Jan.... 6	0.9	.....	.....	.....	.....	2.03	308		
14	4.4	.....	.....	.....	.....	3.25	519		
21	5 0	.....	.....	.....	.....	2.99	482		
28	2.7	.....	.....	.....	.....	2.28	356		
Feb.... 5	1.0	.....	.....	.....	.....	1.88	286		
18	5.4	.....	.....	.....	.....	3.24	525		
1879.									
Dec ...17	2.5	1,389	57.5	82.0	2,415	3.20	444		Tabulation, Report C. of E., 1883, p. 2223. Report on work, ibid. p. 2210. The middle Labarre section was used for floats; its location is shown on plate 1. Observations and reduction by Secretary M. R. C.
1880.									
Jan.... 3	7.5	1,535	62.7	85.6	2,451	4 27	655		
16	10.2	1,667	65.6	87.3	2,541	5.13	855		
26	11.4	1,626	63 4	89 7	2,565	5.08	827		
Feb....13	10.5	1,647	64.2	91.0	2,565	4.54	749		
March 5	11.8	1,640	64.6	89.7	2,530	5.04	824		
18	12.7	1,649	62.6	92.0	2,636	5.24	863		
April.. 1	13.2	1,671	63.1	92.7	2,647	5.90	987		
May....21	12.6	1 576	58 7	95 0	2,665	5.33	844		
June... 1	9.5	1,477	57.2	92.0	2,582	4.46	659		
12	7.6	1,434	59.3	91.0	2,417	4.05	581		
16	7.6	1,415	58.5	90.0	2 417	3.91	553		
19	7 5	1,400	57.7	89.0	2 423	3.73	522		
24	6 9	1,432	59.6	90.0	2,401	3.58	512		
29	5.9	1,408	59 1	90 0	2,381	3.32	467		
July... 2	5.9	1,407	58.8	88.0	2,392	3.52	495		
8	6.9	1,432	59.1	87.0	2,422	3.83	548		
16	8.4	1,487	60 8	88.0	2,445	4.21	625		
24	8.6	1,487	60.8	88 0	2,445	4.39	654		
31	7.6	1,513	62.5	90.0	2,438	3.89	558		
Aug.... 5	5.7	1,438	60.7	86.0	2,369	3.38	486		
9	4.1	1,457	57.6	86.0	2,359	2.95	430		
16	2.6	1,384	56.2	86.0	2,350	2.59	359		

MISSISSIPPI RIVER.—CARROLLTON, LA.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1880.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Aug....20	2.0	1,344	55 4	81.0	2,344	2.33	313	F	M = meter.
24	1.6	1,334	55.3	81.0	2,341	2.37	316	F	F = double floats.
27	1.8	1,320	54.6	81.0	2,342	2.17	287	F	R = rod floats.
Sept... 3	1.3	1,312	54 7	81.0	2,346	1.71	225	F	
13	2.3	1,347	55.0	83.0	2,351	2.38	320	F	
18	2.4	1,370	55.5	83.0	2,365	2 42	331	F	
21	2.5	1,327	55 9	83 0	2,358	2.60	358	F	
30	1.3	1,343	55.9	82.0	2.347	1.95	261	F	
Oct.... 8	1.7	1,308	53.8	80.0	2,350	1.97	258	F	
1883.									
Jan....27	4.6	1,475	64.5	.....	2,289	2.83	418	M	Cambronne section was used. Report on observations, Report C. of E. 1884, p. 2875.
30	5.0	1,487	64.9	.....	2,290	3.01	447	M	
31	5.4	1,497	65.4	96.8	2,290	3.03	453	M	
Feb.... 1	5.6	1,509	65.9	.....	2,290	3.05	460	M	
2	6.4	1,537	67.1	98.7	2,290	3.25	499	M	Observations by fourth district officer M. R. C. Tabulation of final reduction in Secretary's office, Report C. of E. 1889, p. 2642.
5	7.6	1,565	67.6	.....	2,314	3.84	601	M	
7	8.5	1,630	68.6	.....	2,332	4.14	662	M	
8	8.7	1,597	68.2	102.2	2,340	4.09	653	M	
9	9.0	1,600	68.3	.....	2,344	4.18	668	M	
10	9.2	1,627	69.3	.....	2,348	4.18	681	M	
13	9.5	1,635	69.4	.....	2,358	4.20	688	M	
15	9.9	1,631	69.0	.....	2,364	4.28	698	M	
17	10 4	1,634	69.0	.....	2,369	4.71	769	M	
19	10.9	1,626	68.5	104.4	2,375	4.87	791	M	
20	11.1	1,629	68.0	105.4	2,398	4.93	803	M	
21	11.2	1,624	67.6	103.6	2,400	4.98	809	M	
22	11.4	1,630	67.4	103.9	2,428	4.95	809	M	
23	11.8	1,693	66.0	104.5	2,518	5.17	860	M	
28	12.2	1,655	65.1	.....	2,541	5.32	881	M	
March. 1	12.3	1,650	64.8	104.5	2,548	5.47	902	M	
2	12.4	1,657	64.9	.....	2,554	5.29	877	M	
3	12.3	1,658	65.0	105.6	2,549	5.39	894	M	
5	12.5	1,640	64.0	.....	2,561	5.46	896	M	
7	12.7	1,635	63.7	.....	2,567	5.58	912	M	
9	13.0	1,642	64.0	106.7	2,567	5.70	936	M	
12	12 8	1,606	62.6	.....	2,567	5.67	911	M	
13	12.7	1,591	62.0	102.0	2,567	5.60	891	M	
14	12.9	1,605	62 5	.....	2,567	5.69	913	M	
15	12 9	1,610	62.7	106.7	2 567	5.76	928	M	
16	13.1	1,620	63.1	.....	2,567	5.69	922	M	
17	13.2	1,625	63.3	105.8	2,567	5.66	920	M	
19	13.3	1,620	63.1	.....	2,567	5.74	930	M	
20	13.5	1,624	63.3	105.6	2,567	5.84	948	M	
21	13 4	1,632	63.6	.....	2,567	5.85	955	M	
22	13.3	1,630	63.7	104.6	2,567	5.85	958	M	
23	13.5	1,634	63.7	.....	2,567	5.87	959	M	
24	13.7	1,636	63.7	105.6	2,567	5.88	961	M	
26	14.0	1,623	63.2	.....	2,567	6.24	1,013	M	
28	14.1	1,606	62.6	105.5	2,567	6.22	998	M	
29	14.3	1,622	63.2	.....	2,567	6.17	1,001	M	
30	14.6	1,638	63 8	.....	2,567	6.13	1,004	M	
31	14.5	1,646	64.1	106.0	2,567	6.14	1,012	M	
April.. 2	14 8	1,653	64.8	.....	2,567	6.25	1,040	M	
3	14.9	1,668	64.9	105 8	2,568	6.19	1,033	M	
4	15.1	1,711	66.6	106.1	2,568	6.09	1,043	M	
5	15.0	1,720	67.0	.....	2,568	6.09	1,047	M	
6	15 1	1,726	67.2	107.0	2,568	6.00	1,035	M	
7	15.4	1,744	67.9	.....	2,568	6.23	1,086	M	
9	15.4	1,752	68 2	110.0	2,568	6.00	1,050	M	
10	15.3	1,760	68.6	.....	2,568	6.00	1,056	M	
11	15.1	1,769	68.9	.....	2,568	5.83	1,031	M	
12	15.1	1,781	69 3	108.3	2,568	5.80	1,033	M	
14	15.0	1,838	71.6	110 6	2,568	5.62	1,033	M	
16	14.8	1,798	70 0	109.9	2,567	5 56	1,000	M	
17	14.7	1,810	70.5	.....	2,567	5.55	1,005	M	

Mississippi River.—Carrollton, La.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1883.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
April. 18	14.6	1,824	71.1	107.8	2,567	5.53	1,009	M	M = meter.
19	14.6	1,826	71.1	.....	2,567	5.47	999	M	
20	14 6	1,829	71.3	108 7	2,567	5.41	990	M	
21	14.5	1,820	70.9	.....	2.567	5.31	967	M	
23	14 5	1,809	70.5	107.9	2,567	5.39	976	M	
24	14.4	1,799	70.1	.....	2,567	5.33	959	M	
25	14.3	1,787	69.6	108.0	2,567	5.35	956	M	
26	14.2	1.791	69 8	.....	2,567	5.32	953	M	
27	14.1	1,797	70.0	108.5	2,567	5 36	964	M	
28	14.2	1,795	69.9	.....	2,567	5.42	972	M	
30	14.2	1,793	69 8	107.7	2,567	5.33	956	M	
May... 1	14 2	1,790	69.7	.....	2,567	5.26	941	M	
2	14.2	1,787	69 6	107.4	2,567	5.26	940	M	
3	14.2	1,794	69.8	.....	2,567	5.26	943	M	
4	14.2	1,797	70.0	108 3	2,567	5.25	944	M	
5	14.3	1,797	70.0	....	2,567	5.26	945	M	
7	14.0	1,788	69.6	107.8	2,567	5 27	941	M	
8	14.0	1,772	69.1	.....	2,567	5.30	940	M	
9	14.0	1,757	68.5	106.5	2,567	5.26	924	M	
10	14.1	1,768	68.8	.....	2,567	5.39	953	M	
11	14.1	1,775	69.2	108.3	2,567	5.28	937	M	
12	14.1	1,764	68.7	.....	2,567	5.36	946	M	
14	14.0	1,743	67.9	107.9	2,567	5.36	934	M	
15	14.0	1,743	68.0	.....	2,567	5.34	930	M	
16	14.1	1,747	68.1	106.7	2,567	5.30	927	M	
17	14.1	1,749	68.2	.....	2,567	5.24	916	M	
18	14.2	1,753	68.3	107.2	2,567	5.17	907	M	
19	14.2	1,770	68.9	.....	2,567	5.18	916	M	
21	14.1	1,799	70.1	109.7	2,567	5.11	919	M	
22	14.1	1,806	70.4	.....	2,567	5.20	938	M	
23	14.0	1,811	70.5	.....	2,567	5.06	916	M	
24	13.8	1,814	70.7	108.5	2,567	5.02	910	M	
25	13.7	1,819	70 9	.....	2,567	4.95	901	M	
26	13.7	1,826	71.1	107.4	2,567	4.96	905	M	
28	13.6	1,811	70.6	.....	2,567	4.93	898	M	
29	13.6	1,807	70 4	106.5	2,567	4.87	880	M	
30	13.7	1,836	71.5	109.4	2,567	4 85	890	M	
31	13.7	1,831	72.8	.....	2,517	4.81	881	M	
June... 1	13 6	1,824	73.9	108.7	2,467	4.67	883	M	
2	13.5	1,822	73.9	.....	2,467	4.78	872	M	
4	13.4	1,809	73.3	107.3	2,467	4.88	883	M	
5	13.5	1,822	73.8	.....	2,467	4.81	876	M	
6	13 4	1,825	74.0	109.0	2,467	4.80	875	M	
9	13.3	1,827	74.6	.....	2,450	4.73	864	M	
14	13.0	1,838	76.1	.....	2,417	4.39	808	M	
23	12.4	1,797	74.3	.....	2,417	4.58	823	M	
25	12.4	1,813	75.0	106.6	2,417	4.56	827	M	
26	12.6	1,815	75.1	.....	2,417	4.62	840	M	
27	12 5	1,814	75.0	106.4	2,417	4.59	832	M	
28	12.4	1,816	75.4	.... ..	2,409	4.61	837	M	
29	12.5	1,821	75.9	.... ..	2,400	4.67	850	M	
30	12.6	1,815	75.9	106.8	2,392	4.60	834	M	
July... 2	12.5	1,817	76.0	.....	2,392	4.62	840	M	
3	12.4	1,811	75 7	105.7	2,392	4.60	832	M	
5	12.4	1,812	75.7	.....	2,392	4.51	817	M	
6	12.4	1,811	75.7	104.7	2,392	4.49	812	M	
7	12.4	1,812	75.7	.....	2,392	4.55	824	M	
9	12.5	1,808	75.6	105.7	2,392	4.43	800	M	
10	12.5	1,804	75.3	.... ..	2,395	4.46	805	M	
11	12.5	1,800	75.1	104.3	2,397	4.56	820	M	
13	12.6	1,814	75.7	.....	2,397	4.60	834	M	
14	12 6	1,816	75.8	104 9	2,397	4 60	836	M	
16	12.6	1,825	75 9	.... ..	2,404	4 52	824	M	
17	12.4	1,826	75.8	105.4	2.407	4.44	811	M	
18	12.4	1,820	75.9	.....	2,399	4.11	747	M	

MISSISSIPPI RIVER.—CARROLLTON, LA.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1883.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
July...19	12.3	1,814	75.8	105.6	2,392	4.44	805	M	M = meter.
20	12.3	1,814	75.8	.....	2,392	4.46	809	M	
21	12.3	1,812	75.7	105.1	2,392	4 42	800	M	
25	11.7	1,787	74.9	105 6	2,387	4.34	777	M	
28	11.5	1,783	74 7	106.0	2,387	4.11	733	M	
31	11.2	1,750	73.9	104.5	2,367	4.23	741	M	
Aug ... 4	9.8	1,728	73.8	104.0	2,337	3.93	678	M	
8	8.5	1,683	72.6	102.8	2,317	3.42	576	M	
11	7.4	1,651	71.5	100.1	2,310	3.26	538	M	
15	6.6	1,617	70.3	99.7	2,300	3.13	506	M	
18	6.1	1,610	70.5	99.8	2,282	2.99	482	M	
22	5.3	1,595	69.2	98.0	2,304	2.77	442	M	
25	4.8	1,581	69.0	99.0	2,292	2.62	414	M	
29	3.9	1,541	68.8	98.0	2,240	2.32	357	M	
Sept.... 7	1.9	1,507	68.8	.....	2,189	2.06	310	M	
1884.									
April..15	14.2	1,973	.....	.....	.....	4.52	892		Observation, April 15, by "Patrol" party under Secretary M. R. C. Results in Report C. of E. 1885, p. 2850.
Oct.... 8	1.7	1,505	67.6	123.6	2,227	1.96	296	M	
9	2.1	1,527	68.4	120.0	2,231	2.10	320	M	
10	2.9	1,523	68.3	122.9	2,230	2.32	353	M	
11	3.1	1,552	69.6	124.6	2,231	2.18	339	M	
13	3.6	1,570	70.4	121.6	2,230	2.42	379	M	Report on observations, and tabulation, 1884, in Report C. of E. 1887, p. 2866.
14	3.7	1,580	70.8	123.4	2,232	2.48	392	M	
16	3.6	1,555	69.7	123.1	2,230	2.57	400	M	
17	3.2	1,552	69.6	125.5	2,230	2.57	398	M	
18	3.0	1,538	69.0	120.6	2,229	2.53	392	M	Section about 1800 feet below the Cambronne sections of 1879-80.
20	3.1	1,548	69.4	123.0	2,230	2.48	376	M	
21	3.1	1,575	70.6	126.1	2,231	2.57	405	M	Observations and reduction under Secretary M. R. C.
22	3.2	1,565	.....	.....	2,231	2.51	393	M	
24	3 6	1,549	69.3	123.2	2,233	2.56	396	M	
25	3 3	1,544	69.2	121.8	2,232	2.68	413	M	
27	3.8	1,563	70.0	124.0	2,233	2.40	375	M	
29	3.5	1,561	69.9	123.2	2,232	2.24	350	M	
30	3.1	1,551	.....	.....	2,232	2.33	361	M	
31	2.8	1,539	69.0	121.8	2,232	2.28	351	M	
Nov.... 1	2 6	1,512	67.7	120.2	2,232	2.34	353	M	
3	2.4	1,524	68.4	120.6	2,229	2.26	345	M	
4	2.4	1,525	68.4	117.7	2,230	2.27	346	M	
5	2.6	1,534	.....	.....	2,230	2.18	334	M	
6	2.5	1,537	68.9	121.6	2,230	2.27	348	M	
7	2.6	1,539	69.0	122.3	2,230	2 44	375	M	
8	2.5	1,531	.....	.....	2,230	2.18	334	M	
10	2.2	1,514	68.0	122.8	2,228	2.12	321	M	
11	2.2	1,519	.....	.....	2,228	2.18	332	M	
12	2.2	1,524	.....	.....	2,228	1.92	292	M	
13	2.1	1,526	68.4	121.9	2,229	2.03	309	M	
14	2.0	1,512	67.9	121.4	2,227	1.99	301	M	
15	1.8	1,523	68.4	120 5	2,227	1.98	302	M	
17	1.4	1,514	68.0	122.2	2,225	1 98	300	M	
18	1.5	1,537	69.1	122.0	2,225	1.93	297	M	
19	1.3	1,518	68.2	122.0	2,225	1.95	295	M	
20	1.2	1,514	.....	.....	2,225	1.89	286	M	
21	1.1	1,509	68.0	121.9	2,220	1.80	271	M	
24	1.4	1,521	68.3	122.1	2,226	1.77	269	M	
26	1.4	1,531	68.8	120.3	2,224	1.65	253	M	
27	1.4	1,532	.....	.....	2,224	1 61	247	M	
29	0 8	1,522	68.6	121.9	2,220	1.83	279	M	
Dec.... 1	0.4	1,501	67.6	116 9	2,221	1.71	257	M	
2	0 3	1,491	67.2	119.4	2,220	1.80	268	M	
3	0.5	1,498	67.5	118 4	2,220	1.76	263	M	
5	1.2	1,529	68.7	119.7	2,226	1.78	273	M	
6	1.8	1,549	69.6	121.9	2,227	2.02	312	M	
8	1.4	1,528	68.7	119.4	2,225	1.88	288	M	
9	1.3	1,526	.....	.....	2,225	1.87	286	M	
12	1 4	1,527	68.7	123 2	2,224	1.87	286	M	
13	1.1	1,521	.....	.....	2,223	1.74	264	M	
15	1.0	1,520	68 3	119.6	2,224	1.70	259	M	

Mississippi River.—Carrollton, La.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1884.	feet.	100sq.ft	feet.	feet.	feet.	feet.	1000 cu.ft.		
Dec ..16	0.7	1,502	67.6	121.0	2,223	1.95	298	M	M = meter.
17	0.6	1,496	.....	.....	2,223	1.73	259	M	
19	0.6	1,484	66.8	120 0	2,223	1.80	267	M	
22	2.2	1,529	68.6	121 5	2,229	2.24	343	M	
23	2 5	1,547	69.3	123.2	2,231	2.11	326	M	
24	2.7	1,546	69.3	122.3	2,231	2.22	343	M	
25	2.9	1,556	.....	.....	2,231	2.30	357	M	
26	2.9	1,565	70.1	122.8	2,231	2.47	387	M	
29	3.8	1,596	.....	.....	2,234	2.74	437	M	
30	3.9	1,598	71.5	125.5	2,234	.....	.....	M	
31	4.1	1,595	.....	.....	2,235	2.82	450	M	
1885.									
Jan.... 2	4.9	1,599	71.4	126.4	2,240	3.02	483	M	
3	5.3	1,611	.....	.....	2,241	3.03	488	M	
7	8 4	1,692	73.9	129.9	2,289	4.27	723	M	
8	9.1	1,706	.....	.....	2,292	4.31	736	M	
9	9.9	1,727	74 8	130 2	2,307	4.65	803	M	
10	10.4	1,735	.....	.....	2,308	4.77	827	M	
12	11 2	1,746	73.5	135.5	2,375	4.92	860	M	
14	11 7	1.773	74.6	135.3	2,375	5.08	901	M	
15	11.9	1,776	.....	.....	2,375	4.98	885	M	
16	12.4	1,785	.....	.....	2,375	5.20	929	M	
17	12.2	1,775	74.7	133.1	2,375	5.23	928	M	
19	12.5	1.769	71.5	136.8	2,475	.....	.....	M	
20	12.8	1,800	.....	.....	2,475	5.40	972	M	
21	13.0	1,818	71.7	135.4	2,476	5.36	975	M	
26	13 2	1,794	70.8	135.8	2,532	5.57	1,000	M	
27	13.3	1,796	.....	.....	2,532	5.73	1,029	M	
28	13.4	1,802	72.6	136.6	2,482	5.79	1,043	M	
29	13 4	1,788	.....	.....	2,545	5.83	1,042	M	
30	13.4	1,772	.....	.....	2,545	5.89	1,043	M	
31	13.5	1,766	68.9	143 5	2,562	5.75	1,015	M	
Feb.... 2	13.5	1,788	70.2	143.1	2,548	6.16	1,102	M	
3	13.6	1,787	.....	.....	2,549	5.86	1,047	M	
6	13.4	1,777	.....	.....	2,532	5.72	1,017	M	
7	13.4	1,777	70.2	147.2	2,532	5.85	1,040	M	
10	13.2	1,741	69.1	131.0	2.517	5.69	990	M	
11	13.0	1,782	.....	.....	2,517	5.61	1,000	M	
12	13.2	1,842	73.3	141.5	2,512	5.37	989	M	
13	13.0	1,837	.....	.....	2,511	5.33	980	M	
14	13.0	1,836	73.4	140.5	2,500	5.21	956	M	
16	12.6	1,845	74.7	134.2	2,470	5.04	930	M	
18	12.3	1,851	75.2	131.2	2,460	4.87	902	M	
19	12.2	1,815	.....	.....	2,460	4.87	884	M	
20	12.1	1,779	72.6	133.0	2,451	4.78	851	M	
21	12.1	1,778	.....	.....	2,450	4.57	813	M	
23	12.0	1,775	72.6	127.0	2,444	4.60	816	M	
25	11.9	1,797	73 7	133.6	2,439	4 71	847	M	
26	11.8	1,780	74.7	132.8	2,383	4 58	812	M	
27	11.7	1.782	.....	.....	2,383	4.54	809	M	
28	11.4	1,778	74.9	131.3	2,373	4 61	819	M	
March. 2	11.2	1,713	72.3	136.4	2,368	4 34	743	M	
3	10.8	1,698	.....	.....	2,366	4.23	718	M	
4	10.7	1,697	.....	.....	2,365	4.02	683	M	
5	10.3	1,689	.....	.....	2,363	3.94	665	M	
6	9.9	1,683	71.4	132.4	2,357	4.05	681	M	
7	9.5	1,669	.....	.....	2,352	3.81	652	M	
9	8.9	1,642	70 3	127.1	2,335	3.89	638	M	
10	8.7	1,637	70 2	126.3	2,331	3.80	621	M	
11	8.7	1,630	.....	.....	2,330	3.84	625	M	
13	8.7	1,621	.....	.....	2,331	3.79	615	M	
14	8.8	1,618	69.4	127.0	2,330	3.81	616	M	
16	9.4	1,636	.....	.....	2,335	3.96	649	M	
17	9 6	1,640	70.2	128 6	2,337	4.05	665	M	
18	9.7	1,661	71.1	130.2	2,335	4 02	667	M	
19	9.9	1,653	.....	.....	2,336	4.14	684	M	
20	10.2	1,646	70.4	130.7	2,337	4.10	675	M	

MISSISSIPPI RIVER.—CARROLLTON, LA.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1888.	feet.	100sq.ft	feet.	feet.	feet.	feet.	100cu.ft.		
March.21	10.6	1,657	.....	.....	.....	4 28	710	M	M = meter.
23	10.7	1,665	70.2	134.4	2,370	4.36	725	M	
24	10.9	1,662	69.9	130.7	2,377	4.45	740	M	
25	11.0	1,661	69.9	129.7	2,377	4.45	739	M	
1889.									
Feb....22	8.8	1,763	74.9	107.6	2,353	3.84	676	M	Report on observations and tabulation in Report of C. of E. 1891, p. 3522.
23	8.6	1,740	74.1	107.0	2,347	3.74	650	M	
25	7.8	1,705	72.8	106.1	2,341	3 67	626	M	
26	7.5	1,725	73.6	109.1	2,344	3.76	649	M	
27	7 5	1,724	73.6	106.0	2,344	3.85	665	M	
28	7.8	1,737	74 1	107 0	2,345	3.64	632	M	Observations from 1889 to 1893 inclusive under fourth district officer, M.R. C.; reduction in Secretary's office.
March. 2	9.0	1,784	75.8	109 0	2,354	3.92	699	M	
4	10.1	1,806	76.4	110.4	2,365	4.16	751	M	
6	10 7	1,821	77.1	112.4	2,363	4.23	770	M	
7	10.7	1,818	76.9	115.0	2,363	4 22	767	M	
8	11.0	1,813	76.6	114.7	2,368	4.40	797	M	
9	11.0	*1,801	76.1	113.4	2,368	4.53	816	M	* Soundings interpolated.
11	11.2	1,784	75 2	111.0	2,372	4.56	813	M	
12	11.2	*1,786	75.3	111.4	2,372	4.42	790	M	
13	11.5	1,794	75.5	112.1	2,376	4.46	799	M	
14	11.5	*1,789	75.3	112.6	2,376	4.46	798	M	
15	11.5	1,784	75.1	113.0	2,376	4.35	776	M	
16	11.5	1,795	75 5	115.0	2,376	4.22	757	M	
18	11.5	*1,786	75.1*	112.7	2.376	4.12	735	M	
19	11.0	1,769	74.7	111.0	2,368	4.05	716	M	
20	10.8	1,747	73.9	110.0	2,363	4.25	742	M	
21	10 5	1,737	73.5	113.0	2,363	4.06	705	M	
22	10.2	1,732	73.4	111.5	2,361	4.10	711	M	
23	9.9	1,722	73 0	111.7	2,360	.....	.....	M	
25	9.7	1,767	74.9	107.7	2,360	3.92	692	M	
26	9 4	*1,732	73.6	108.8	2,354	3.85	666	M	
27	9.2	1,701	72.3	110.0	2,352	3.62	616	M	
28	9.0	1,731	73.6	108.0	2,352	3.56	617	M	
29	9.0	*1,711	72.8	108.8	2,352	3.51	601	M	
30	8.9	1,689	71.9	109.5	2,351	3.48	587	M	
April.. 1	8.9	*1,714	72.9	106.2	2,351	3 42	585	M	
2	9.2	1,733	73.7	106.0	2,352	3.73	647	M	
3	9.4	*1,747	74.2	106.3	2,354	3.81	666	M	
4	9.9	1,770	75.0	108.0	2,360	3.98	704	M	
5	9.8	*1,771	75.1	108.9	2,360	3.96	702	M	
6	9.9	*1,777	75.3	110.1	2,360	4 12	733	M	
8	9.9	1,785	75.6	112.2	2,360	4.11	733	M	
9	9.8	1,750	74.2	113 0	2,360	4.04	706	M	
10	9.8	*1,753	74.3	112.9	2,360	3.77	661	M	
13	9.6	*1,757	74.5	112.3	2,360	3.70	650	M	
15	9.5	1,760	74.7	112.0	2,356	3.63	639	M	
16	9 4	*1,737	73.8	111.5	2,354	3.60	625	M	
17	9.3	1,713	72.8	111.0	2,352	3 45	592	M	
22	8.3	*1,702	72.5	109.5	2,347	3.51	597	M	
23	7.9	1,695	72 3	109 0	2,345	3.67	622	M	
24	7.7	*1,696	72 3	108 3	2,344	3.61	612	M	
25	7.5	*1,697	72.4	107.6	2,344	3.62	614	M	
26	7.4	1,700	72.5	107 0	2,344	3.56	605	M	
27	7.4	*1,697	72.4	107.0	2,344	3.56	604	M	
29	7 2	*1,687	72.0	106.8	2,344	3.56	601	M	
May.... 1	7.5	1,685	71.9	107.0	2,344	3 59	605	M	
2	7 6	1,684	71.9	105.0	2,344	3.63	611	M	
3	7.8	*1,691	72 1	105.3	2,345	3.83	648	M	
4	7.8	1,695	72.3	105 4	2,345	3.58	607	M	
6	7.7	1,701	72.5	107.0	2,345	3.44	586	M	
7	7.5	1,688	72.0	106.5	2,344	3.44	580	M	
8	7.2	1,693	72 2	109 0	2,344	3.39	574	M	
9	6.9	*1,681	71.8	109.5	2,342	3.35	563	M	
10	6.5	1,667	71.3	110.0	2,337	3.26	543	M	
11	6.2	1,664	71.7	106.0	2,320	3.27	544	M	
13	5.2	*1,646	71.3	105.1	2,310	3.21	528	M	
14	4 8	1,639	71.3	104 7	2,298	2.90	474	M	
15	4.3	1,628	71.2	105.0	2,287	2.77	452	M	
16	3.8	1,620	71.0	104.3	2,282	2.72	441	M	

Mississippi River.—Carrollton, La.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1889.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
May....17	3.6	*1,615	70.9	104 0	2,276	2.64	425		M = meter.
18	3 4	1,610	70.9	103.7	2,270	2.63	423		
20	3 2	1,600	70.7	102.4	2,264	2 68	429		
21	3.2	*1,599	70.6	102.3	2,264	2.60	415		* Soundings interpolated.
22	2.9	1,598	70 6	102.0	2,257	2.62	417		
23	2 7	*1,589	70.5	101.8	2,255	2.64	419		
25	2.5	1,586	70.3	101.7	2,255	.....	.....		
27	2.5	1,583	70.2	101.6	2.255	2.43	385		
28	2.5	1,582	70.2	101.6	2,255	2.39	378		
Nov....14	0 9	1,438	62.2	100.4	2,312	2.98	429		
15	1 1	1,428	61.7	100 5	2,315	2.98	425		
18	1.5	1,482	63.9	100.5	2,318	3.02	447		
19	1 5	1,476	63.7	99.6	2 318	3.12	461		
20	2.0	1,481	63 8	102.6	2,320	3.16	467		
21	2 5	*1,491	64.0	104.2	2,330	3.16	471		
22	2.5	1,490	63.9	105.4	2,330	3.14	468		
23	2.9	1,498	64.2	106.3	2,335	3.15	472		
25	3.9	1,513	64.7	107.0	2,336	3.24	490		
26	4.4	1,518	64.8	106.0	2,342	3.38	512		
27	5.0	1,532	65.3	107.0	2,345	3.57	547		
28	5.3	1,533	65.3	107.0	2,347	3.52	549		
29	5.6	1,556	66.1	108.0	2,356	3.58	557		
30	5.8	1,562	66.0	108.0	2,365	3.55	554		
Dec.... 2	6.0	1,592	67.1	109.4	2,371	3.50	567		
3	6.2	1,599	67.4	110.0	2,372	3.69	590		
4	6.3	1,615	68.0	109.6	2,378	.....	.....		
5	6.5	1,632	68.7	110.2	2,375	3.76	614		
6	6.5	*1,632	68.7	110.0	2,375	3.79	618		
7	6.9	1,642	68.9	110.2	2,388	3.74	614		
9	7.4	1,648	68.9	110.5	2,394	3.84	632		
10	7.6	1,649	68.7	110 2	2,399	3.90	643		
11	7.6	1,647	68.6	111.0	2,399	3.91	644		
12	7.6	1,646	68.6	109.8	2,399	3.93	647	M	
1890.									
Feb. †26	14.7	1,987	80.0	114.0	2,420	7.34	1,422		Section the same as in 1889.
†27	14.8	1,920	79.4	113.0	2,420	6.72	1 290		Tabulation, Report C. of E. 1891, p. 3541.
†28	15 1	1,954	80.8	114.4	2,420	7.14	1,396		† Observations unreliable.
March 1	14.9	1,913	80 3	112.5	2,420	6.58	1,268		
3	15.0	1,789	78.9	114.0	2,420	6.55	1,171		
4	14.9	1,791	74.0	106.5	2,420	6.20	1,110		
5	15.0	1,809	74.8	106.2	2,420	6.38	1,151		
6	15.2	1,791	74.0	107.0	2,420	6.56	1 175		
7	15.2	1,752	72.4	105.5	2,420	6.44	1,128		
8	15.2	1,721	71.1	113.0	2,420	6.78	1,166		
10	15.4	1,802	76.9	112.0	2,420	6.87	1,280		
11	15.4	1,852	76.5	112.2	2,420	6 18	1,144		
12	15.4	1,845	76.2	112 9	2,420	6.24	1,151		
14	16.0	1,871	77.3	113.1	2,420	6 90	1,292		
18	15 9	1,868	77.2	112.0	2,420	6.44	1,208		
19	15.9	1,861	76.9	114.0	2 420	6.68	1,243		
20	15 8	1,887	78.0	112.3	2 420	6.75	1,273		
21	15.9	1.917	79.2	113 7	2,420	6.22	1,193		
22	15.9	1,898	78.0	117.0	2,420	5.95	1,124		
24	15.6	1,926	79.6	112.5	2,420	6.00	1,156		
25	15 5	1,918	79.0	112 5	2,420	6.11	1,169		
26	15.4	1,891	78.1	113 5	2,420	6.22	1,177		
28	15.5	1,846	76 3	110.0	2,420	5.99	1,106		
29	15.2	1,814	75.0	116.5	2,420	5.91	1,073		
31	15.2	1,828	75.4	117.0	2,420	5.93	1,082		
April.. 1	15.1	1,811	74.8	115.0	2,420	5.90	1,069		
2	15.2	1,799	74.3	111.2	2,420	5.92	1,065		
3	15.6	*1,815	75.0	.....	2,420	6 09	1,106		
4	15.4	1,820	75.2	116.7	2,420	6.00	1,092		
5	15.3	1,821	75.2	113.8	2,420	6.05	1,102		
7	15 3	1,824	75.4	112.8	2.420	6.01	1,096		

MISSISSIPPI RIVER.—CARROLLTON, LA.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1890.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
April.. 8	15.2	1,821	75.2	113.0	2,420	6.00	1,091		M = meter.
9	15.2	1,791	74.0	112.8	2,420	5.95	1,067		
10	15.1	1,799	74.4	115.0	2,420	5.91	1,063		
11	15.0	1,789	73.9	114.2	2,420	5 72	1,024		
12	15.0	1,800	74.4	113.0	2,420	5.75	1,034		
14	15.0	1,798	74.3	112.0	2,420	5 68	1 021		
15	15.0	1,800	74.4	112 8	2,420	5.64	1,016		
16	15.0	1,816	75.0	114.0	2,420	5.58	1,013		
28	14.0	1,822	75.3	112.2	2,420	5 49	999		
29	14.0	1,812	74.9	113.8	2,420	5.42	982		
30	14.0	1,806	74 6	111.4	2,420	5.36	968		
May.... 1	13.8	1,793	74.1	112.0	2,420	5.47	981		
6	13.7	1,776	73.4	110.0	2,420	5 21	926		
14	13.4	1,786	73.8	109.0	2,420	5.14	918		
1891.									
March. 4	14.4	1,695	71.0	111.0	2,388	6.49	1,100		Report on observations in Report C. of E. 1892, p. 3126. Tabulation, ibid. p. 3138.
6	14.5	1,728	72.3	114.0	2,388	6.63	1,146		
9	14.6	1,725	72.2	120 0	2,388	6 34	1,093		
10	14.9	1,720	72 0	120.0	2,388	6.48	1,114		
12	15.3	1,730	72.4	110.0	2,388	6 38	1,108		
13	15.5	1,736	72.7	113.0	2,388	6 74	1,169		Section at same place as in 1889 and 1890.
14	15.6	1,728	72.4	112 0	2,388	6 95	1,202		
16	16.0	1,735	72.7	115 0	2,388	6.81	1,182		
17	15.9	1,760	73.7	115.0	2,388	6.89	1,213		
18	15.8	1,757	73.6	115.0	2,388	6.57	1,154		
a.m. 19	15.6	1,740	72.9	109 0	2,388	6.75	1,175	M	
p.m. 19	15.6	1,755	73.5	113.0	2,388	6 57	1,153		
20	15.6	1,760	73.7	113.5	2,388	6.69	1,178		
21	15.4	1,762	73.8	112.5	2,388	6 76	1,191		
23	15.3	1,769	74.1	111.0	2,388	6.57	1,162		
24	15.2	1,775	74.3	115.0	2,388	6.63	1,177		
25	15.3	1,768	74.0	114.0	2,388	6.48	1,146		
27	15.1	1,763	73.8	114.0	2,388	6 45	1,137		
28	15.0	1,760	73.7	113.0	2,388	6.50	1,145		
30	15.0	1,756	74.8	117.0	2,388	6.35	1,135		
31	15.2	1,793	75.1	119.0	2,388	6.44	1,155		
April.. 1	15.2	1,797	75.2	120.0	2,388	6.49	1,166		
2	15.0	1,773	74.2	117.0	2,388	6 47	1,148		
3	15.0	1,778	74.5	118.0	2,388	6 48	1,152		
4	14.8	1,768	74.1	119.0	2,388	6.69	1,184		
6	14.8	1,780	74.5	118.0	2,388	6.56	1,168		
7	14.6	1,764	73.9	117 0	2,388	6.57	1,159		
8	14 8	1,761	73.8	117.0	2,388	6.61	1,165		
9	14.8	1,772	74.2	118.0	2,388	6.86	1.215		
10	14.9	1,788	74.9	118.0	2,388	6.73	1,203		
11	14.9	1,789	74.9	118.0	2,388	6.39	1,144		
13	14.7	1,782	74.6	115.0	2,388	6.65	1,185		
14	14 8	1,783	74.7	119.0	2,388	6.48	1,156		
15	14.6	1,790	75.0	118.0	2,388	6.51	1,166		
16	14.6	1,788	74.9	118.9	2,388	6.49	1,160		
				¶ *Henry Clay Avenue.*					
April.. 3	15.0	2,236	107.0	180 0	2,091	4.86	1,088		
4	14 8	2,245	107.3	180 0	2,091	5.12	1,149		
6	14.8	2,194	104.9	175.0	2,091	4.88	1,071		
7	14.6	2,186	104.6	175 0	2,091	5.06	1,106	M	
8	14.8	2,173	103.9	175.0	2,091	4.89	1,064		
9	14.8	2,160	103.0	174.0	2,091	5.09	1,100		
10	14.9	2,169	103 7	174.0	2,091	5.39	1,168		
14	14.8	2,162	103.4	174.0	2,091	4.80	1,038		

¶ This discharge section is about 2¼ miles below the regular Carrollton section and about ¾ mile below the lower end of the Ames crevasse, which occurred March 16, and increased until the estimated discharge was 91000 cubic feet per second between April 6 and 14. See Report C. of E., 1891, p. 3684.

Mississippi River.—Carrollton, La.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1892.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
May ...14	16.0	1,703	68.4	101.0	2,490	6.15	1,017		M = meter.
16	16.2	1,727	69.4	102.8	2,490	5.98	1,032		
18	16.2	1,761	70.7	103.0	2,490	6.15	1,083		Report on observations in Report C. of E. 1893, p. 3680; tabulation, Ibid. p. 3693.
19	16.1	1,766	70.9	102.8	2,490	6.29	1,111		
21	16.3	1,741	69.9	103 0	2,490	6.09	1,059		
24	16 3	1,769	71.0	102.0	2,490	5.96	1,055		
27	16.2	1,747	70.2	100.0	2,490	5.99	1,046		
June... 1	16.5	1,770	71.1	100.0	2 490	5.97	1,056		
4	16 6	1,794	72.1	104.0	2,490	6.08	1,091	M	
6	16.7	1,846	74.1	105.0	2,490	5.89	1,088		
8	16.7	1,842	74.0	104.0	2,490	6.08	1,121		
10	17 0	1,838	73.8	104.5	2,490	5.87	1,079		
14	16.7	1,848	74.2	104.0	2,490	5.91	1,092		
17	16 1	1,823	73.2	103.0	2,490	5.76	1,051		
20	16.1	1,801	72.3	103 0	2,490	5.71	1,028		
24	15.9	1,755	70.5	102.0	2,490	5.81	1,021		
30	15.5	1,728	69.4	101.0	2,490	5 65	977		
				† *Upper Section.*					
1893.									
June... 3	15.6	1,757	72.4	106 5	2,426	5 66	995		
8	15.8	1,784	73 5	104.9	2,426	5.62	1,003		
9	15.9	1,786	73.6	104.8	2,426	5.73	1,024		
12	16.2	1,816	74.9	104 4	2,426	5.66	1,029		
15	16.8	1,806	74 5	103.5	2,426	5.58	1,007		
*16	16.6	1,846	76.1	105.1	2,426	5.60	1,035		*a. m.
*17	16.4	1,856	76.5	103 2	2,426	5.74	1,036		
†19	17 0	1,873	77.2	106 0	2,426	5.82	1,089		†p. m.
†21	17.2	1,906	78.6	108.8	2,426	5.88	1,120		
*22	17.3	1,911	78.8	108.8	2,426	5 82	1,113	M	
†23	17.5	1,915	78.9	107 0	2,426	5.78	1,106		
†24	17.2	1,931	79.6	108.1	2,426	5.85	1,129		
*26	17.0	1,949	80 0	106.7	2,426	5.61	1,039		
†26	17.0	1,940	80.0	106.7	2,426	5.61	1,088		
†28	16.8	1,914	78.9	105.5	2,426	5.51	1,055		
†30	16.6	1,892	78.0	106.0	2,426	5.48	1,036		
July... 1	16.4	1,899	78.3	107.0	2,426	5.39	1,024		
* 3	16.1	1,869	77.0	105.6	2,426	5.45	1,019		
				‡ *Lower Section.*					
June...13	16.2	1,837	74.1	111.6	2,480	5.56	1,022		
15	16 8	1,814	73.1	110.1	2,480	5.54	1,004		
†16	16.6	1,820	73.4	111.0	2,480	5.66	1,031		
†17	16.6	1,824	73.5	111.0	2,480	5.76	1,051		
*19	16 6	1,860	75.0	112.5	2,480	5.93	1,103		
*21	17.0	1,806	72.8	112.4	2,480	5.99	1,081		
†22	17.2	1,828	73.7	111.6	2,480	5.89	1,076		
*23	17.2	1,859	74 6	111.6	2,480	6.00	1,110		
*24	17.0	1,837	74.1	111.7	2,480	5.89	1,082	M	
†24	17.0	1,837	74.1	111.7	2,480	5.86	1,076		
*26	16.8	1,818	73.3	111.2	2,480	5.84	1,062		
†26	16.8	1,818	73.3	111.2	2,480	5.84	1,061		
†27	16.6	1,865	75.2	111.0	2,480	5.66	1,056		
*28	16.4	1,835	74.0	111.1	2,480	5.68	1,043		
*30	16.4	1,810	73.0	110.8	2,480	5.77	1,014		
July...*1	16 1	1,790	72.2	110.1	2,480	5.73	1,025		
†3	15.8	1,762	71.1	108.2	2,480	5.69	1,004		

‡ The upper Section is at foot of St. Charles Street and the Lower Section at foot of Gen. Scott Street; the distance between the sections, on the left bank, is about 4800 feet.

Observations of 1893 under direction of 4th district officer M. R. C., reduction at Secretary's office: printed in Report C. of E., 1894, p. 2842.

Mississippi River.—At the Passes.

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1838.*	feet.	100sq.ft	feet.	feet.	feet.	feet.	1000 cu.ft.		
.....	.....	.....	.....	.....	.....	3 7	810	F	Main trunk of river.
.....	.....	.....	.....	.....	.....	3 9	468	F	Above Pass Loutre. (Northeast Pass.)
.....	.....	.....	.....	.....	.....	3.0	275	F	Between Pass Loutre and Balize bayou. (Northeast Pass.)
.....	.....	.....	.....	.....	.....	3.9	182	F	Below Southeast Pass. (Northeast Pass.)
.....	.....	.....	.....	.....	.....	.....	6	F	Loss by bayous below this point. (Northeast Pass.)
.....	.....	.....	.....	.....	.....	3.9	189	F	Below Pass Cheval (Pass Loutre.)
.....	.....	.....	.....	.....	.....	.....	19	F	Loss by bayous, etc (Pass Loutre.)
.....	.....	.....	.....	.....	.....	2.7	79	F	Southeast Pass.
	.....	.....	.....	.....	.....	3.07	15	F	Balize bayou.
	.....	.....	.....	.....	.....	2.15	7	F	Pass Cheval (sum of branches)
No date.*	Flood.	.....	.....	.....	.....	4.9	340	.....	Head Southwest Pass.
	Flood.	.....	.....	.....	.....	3.9	272	....	Usual. Minimum.
	L. W.	.....	.....	.....	.....	1.4	102	.....	Usual.
	L. W.	.....	.....	.....	.....	1.1	75	.....	Minimum.
1877.									
May...21	10.8	.....	.....	.....	.....	.....	68	.....	South Pass.
21	.....	.....	.....	.....	.....	.....	276	.....	Southwest Pass.
21	.....	.....	.....	.....	.....	.....	292	.....	Pass Loutre.
							637	.....	Total.
22	10.9	.....	.....	.....	.....	.....	71	.....	South Pass.
22	.....	.....	.....	.....	.....	.....	277	.....	Southwest Pass.
22	.....	.....	.....	.....	.....	.....	292	.....	Pass Loutre.
							641	.....	Total.
Sept...10	0.4	.....	.....	.....	.....	.....	27	.....	South Pass.
10	.....	.....	.....	.....	.....	.....	126	.....	Southwest Pass.
10	.....	.....	.....	.....	.....	.....	120	.....	Pass Loutre.
							272	.....	Total.
1878.									
June...8	10.7	.....	.....	.....	.....	.....	62	.....	South Pass.
8	.....	.....	.....	.....	.....	.....	246	.....	Southwest Pass.
8	.....	.....	.....	.....	.....	.....	265	.....	Pass Loutre.
							572	.....	Total.
1879.									
Dec....19	3.2	.....	.....	.....	.....	.....	38	.....	South Pass.
19	.....	.....	.....	.....	.....	.....	167	.....	Southwest Pass.
19	.....	.....	.....	.....	.....	.....	168	.....	Pass Loutre.
							373	.....	Total.
1880.									
Jan ...30	11.8	.....	.....	.....	.....	.....	68	.....	South Pass.
30	.....	.....	.....	.....	.....	.....	282	.....	Southwest Pass.
30	.....	.....	.....	.....	.....	.....	291	.....	Pass Loutre.
							641	.....	Total.
April..21	14.2	.....	.....	.....	.....	.....	78	.....	South Pass.
21	.....	.....	.....	.....	.....	.....	328	.....	Southwest Pass.
21	.....	.....	.....	.....	.....	.....	367	.....	Pass Loutre.
							774	.....	Total.
1880.									
July...24	9.0	.....	.....	.....	.....	.....	52	.....	South Pass.
24	.....	.....	.....	.....	.....	.....	224	.....	Southwest Pass.
24	.....	.....	.....	.....	.....	.....	224	.....	Pass Loutre.
							500	.....	Total.

See notes on p. 105.

*Results taken from Humphreys and Abbot's Report on the Mississippi River, 1861, pp. 476, 497, 498, edition of 1876.

Mississippi River.—At the Passes.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1881.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
June... 4	12.2	.....	.....	.....	.....	.....	64	.....	South Pass.
4	.....	.....	.....	.....	.....	.....	278	.....	Southwest Pass.
4	.....	.....	.....	.....	.....	.....	308	.....	Pass Loutre.
							649	.....	Total.
1894.									
March 21	12 2	.....	.....	.....	.....	.....	56	.....	South Pass.
21	.....	.....	.....	.....	.....	.....	324	.....	Southwest Pass.
21	.....	.....	.....	.....	.....	.....	339	.....	Pass Loutre.
							719	.....	Total.
April..17	12.4	.....	.....	.....	.....	.....	56	.....	South Pass.
17	.....	.....	.....	.....	.....	.....	317	.....	Southwest Pass.
17	.....	.....	.....	.....	.....	.....	380	.....	Pass Loutre.
							753	.....	Total.
May....2	12.4	.....	.....	.....	.....	.....	53	.....	South Pass.
2	.....	.....	.....	.....	.....	.....	293	.....	Southwest Pass.
2	.....	.....	.....	.....	.....	.....	411	.....	Pass Loutre.
							757	.....	Total.
May...15	10.4	.. ....	.....	.....	.....	.....	47	.....	South Pass.
15	.....	.....	.....	.....	.....	.....	243	.....	Southwest Pass.
15	.....	.....	.....	.....	.....	.....	311	.....	Pass Loutre.
							601	.....	Total.

Observations of 1877-81 taken under Capt. W. H. Heuer; 1894 under Maj. J. B. Quinn. Tabulation, Report C. of E. 1894, p. 1847. The gauge readings tabulated are those of the U. S. Engineer gauge at Carrollton, whose zero is 20.91 feet above the Cairo datum plane.

TRIBUTARIES.

St. Croix River.

[Mouth 880 miles above Cairo.]

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1878.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
(71)									
Oct....18	0.6	1,494				2.18	3,252	.....	Below Snake River.
(72) 19	1.9	1,872				3 49	*6,533	.....	*These large discharges were caused by the opening of Snake River dam. The discharge there Oct. 21 was from 2402 to 2545 cubic ft. per second.
19	1 9	1,858				3.28	*6,103	.....	
19	1.9	1,849				3.42	*6,425	.....	
19	1.7	1,801				3.36	*5,740	.....	
19	1.1	1,658				2.60	‡4,321	.....	
(73) 21	1.2	1,387				2.18	*4,010	.....	
(74) 15	0.3	2,420				1.06	2,564	...	Below Rush Creek.
16	0.5	2,420				1.11	2,685	.....	
16	0.5	2.426				1.12	2,718	.....	
(77) 5	0.8	1,962				1.78	3,499	.....	3 miles above Taylor's Falls.
5	0.8	1,948				1.72	3,360	.....	
7	0.7	1,906				1.68	3,199	.....	
7	0 7	1,899				1.64	3,177	.....	
8	0.6	1,860				1.59	2,954	.....	
8	0.6	1,866				1.65	3,086	.....	
9	0.6	1,866				1.61	3,008	.....	
9	0 7	1,877				1.62	3,041	.....	
1879.	Above L. W.								
Oct.....14	†0.6	1,596				1.35	2,159	.....	At head of Kettle River Rapids.
14	†0 6	1,596				1.22	1,951	.....	
	‡L. W.						2,300	.....	12 miles below Taylor's Falls.
	‡L. W.						a 2,800	.....	Above Prescott, mouth of river.
(75) 1882.									
Jan....25	‡L. W.						2,523	M	7 miles above Taylor's Falls.
May....13	‡ 7.0						35,775	M	

† Tabulation, Report C. of E. 1880, p. 1643.
‡ " " " " p. 1604.
a Not less than this.
‡ Minimum of year.
Maximum "

NOTE.—The numbers in parentheses locate sections on map accompanying the original report; map not printed.

The observations of 1878 on the St. Croix were published in Report C. of E. 1879, p. 1234.

Quantities under "Gauge" are heights above low water.

Several of the days more than two discharges were taken; in such cases only the extreme discharges of the days are reprinted here. Several observations on the Upper St. Croix and its tributaries are omitted.

Observations of 1879 and 1882 tabulated in Report C. of E. 1883, p. 1471; also Report C. of E. 1884, p. 1629, and 1892, p. 1827; also tributaries of the St. Croix having a discharge of less than 800 feet, C. of E. 1884, p. 1628.

Chippewa River.

[Mouth 827 miles above Cairo.]

.....	¶ L. W.	.....	.....	.....	.....	.....	1,376	.....	At Eau Claire.
.....	¶ L. W.	.....	.....	.....	.....	.....	4,682	.....	Above head of Beef Slough; about 13 miles above mouth of the Chippewa.
1878.									
(98)Sep 27	b 0.7	1,256	.....	.....	.....	2.42	3,046	.....	At mouth.
(99)Oct 14	b 1.5	1,886	.....	.....	.....	3.28	5,713	.....	" "
(95) 7	b 2.0	2,649	.....	.....	.....	.....	3,501	.....	Above Yellow River.
(92)Nov16	b 0.7	1,621	.....	.....	.....	1.13	1,834	.....	Below the Flambeau.

¶ Report C. of E. 1875, p. 376.
b " " 1879, p. 1235. and 1884, p. 1629.
Also tributaries, ibid.

NOTE.—The numbers in parentheses locate sections on map accompanying the original report; map not printed.

Wisconsin River.

[Mouth 678 miles above Cairo.]

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1867.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
	Above L.W.'67.								F = double floats.
(a) Aug 24	0.25	1,954	.....	.....	.....	1.72	3,360	F	Portage above canal.
24	0.25	.....	.....	.....	.....	.....	3,152	F	Portage below canal.
29	0.05	1,762	.....	.....	.....	2.09	3,679	F	
Sept.... 2	0.1	2,030	.....	.....	.....	1.74	3,538	F	At Dekorra.
10	0.0	1,554	.....	.....	.....	2.11	3,275	F	At Skinner's Bluff.
17	0.0	.....	.....	.....	.....	.....	3.210	F	At Sauk City.
Oct.... 2	1.1	2,059	.....	.....	.....	3.18	6,557	F	At Lone Rock.
4	0.9	3,241	.....	.....	.....	1.83	5,942	F	Middle R. R. Bridge.
18	0.7	2,701	.....	.....	.....	2.20	5,944	F	At Port Andrew.
23	0.65	2,354	.....	.....	.....	2.79	6,568	F	Near Boscobel.
30	0.9	2,886	.....	.....	.....	2.81	8,111	F	Near Wauzeka.
Nov.... 4	0.7	.....	.....	.....	.....	.....	6,977	F	At Bridgeport.
(c) 1871? 1878.	L. W. (f)	1,447	.....	.....	700	1.91	2,764	.....	At Portage.
(d) Oct. 19 1879.	2.85	.....	.....	.....	.....	.....	10,000	F	Portage below bridge
(e) Sept. 25	—0.2	.....	.....	.....	.....	.....	2,518	F	
26	—0.3	.....	.....	.....	.....	.....	2,351	F	
26	—0.3	.....	.....	.....	.....	.....	2,471	F	Portage below canal.
26	—0.3	.....	.....	.....	.....	.....	2,443	F	
27	—0.25	.....	.....	.....	.....	.....	2,612	F	Below Baraboo river.
28	—0.2	.....	.....	.....	.....	.....	2,996	F	At Dekorra.
Oct.... 6	0.0	.....	.....	.....	.....	.....	4,124	F	Portage below bridge
7	0.65	.....	.....	.....	.....	.....	4,076	F	At Dekorra.
1880.									
Aug....19	0.4	.....	.....	.....	.....	.....	3,205	F	Portage below bridge
Sept.... 9	0.6	.....	.....	.....	.....	.....	3,427	F	
11	0.55	.....	.....	.....	.....	.....	3,360	F	Portage below canal; gates, etc., closed.
Oct.... 6	1.1	.....	.....	.....	.....	.....	4,704	F	Portage below bridge
15	0.3	.....	.....	.....	.....	.....	3,745	F	
15	0.3	.....	.....	.....	.....	.....	4,249	F	At Dekorra.
22	1.1	.....	.....	.....	.....	.....	5,164	F	Portage below bridge
1881.									
July... 14	0.6	.....	.....	.....	.....	.....	4,091	F	
15	0.6	.....	.....	.....	.....	.....	4,098	F	
28	0.25	.....	.....	.....	.....	.....	3,659	F	
29	0.1	.....	.....	.....	.....	.....	3,602	F	
29	0.12	.....	.....	.....	.....	.....	3,540	F	
31	0.0	.....	.....	.....	.....	.....	3,317	F	
Aug.... 1	—0.1	.....	.....	.....	.....	.....	3,150	F	
3	—0.2	.....	.....	.....	.....	.....	2,988	F	
6	—0.05	.....	.....	.....	.....	.....	3,145	F	
6	—0.05	.....	.....	.....	.....	.....	3,159	F	Below lock gates and lock valves closed.
7	0.4	.....	.....	.....	.....	.....	3,724	F	Portage below bridge
17	0.55	.....	.....	.....	.....	.....	3,978	F	
18	0.5	.....	.....	.....	.....	.....	3,934	F	
18	0.5	.....	.....	.....	.....	.....	3,907	F	Below lock gates and lock valves closed.
20	0.35	.....	.....	.....	.....	.....	3,760	F	Portage below bridge
22	0.3	.....	.....	.....	.....	.....	3,682	F	
26	0.15	.....	.....	.....	.....	.....	3,626	F	
	(g)								
July.. 14	2.0	.....	.....	.....	.....	.....	5,368	F	At Dekorra, dam No. 2
16	1.85	.....	.....	.....	.....	.....	4,762	F	
17	1.65	.....	.....	.....	.....	.....	4.313	F	
18	1.55	.....	.....	.....	.....	.....	3,955	F	
19	1.5	.....	.....	.....	.....	.....	3,771	F	
Aug....20	1.7	.....	.....	.....	.....	.....	4,305	F	At Dekorra, dam No. 13
22	1.7	.....	.....	.....	.....	.....	4,056	F	
25	1.55	.....	.....	.....	.....	.....	3,813	F	
29	1.52	.....	.....	.....	.....	.....	3,885	F	
1882.									
Sept....29	1.4	.....	.....	.....	.....	.....	3,214	F	At Dekorra, dam No. 11
30	1.4	.....	.....	.....	.....	.....	3,181	F	
Oct.... 1	1.25	.....	.....	.....	.....	.....	2,852	F	
2	1.3	.....	.....	.....	.....	.....	3,116	F	For notes see p. 111.

WISCONSIN RIVER.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Oct.... 3	1.2						2,885	F	At Dekorra, dam No. 11
4	1.15						2,843	F	
7	2.0						4,186	F	
Sept...30	(f) 0.05						3,469	F	Portage below dam No. 2, gates, etc., of lock closed.
Oct.... 2	—0.1						3,286	F	
3	—0.2						3,110	F	
4	—0.25						3,119	F	
7	0.85						4,082	F	
1885.									
	0.9						4,641	(h)	At Portage.
	0.6						4,230		
	0.5						4,233		
	0.4						3,916		
	0.5						4,052		
	0.5						4,023		
	0.4						3,969		
	0.3						3,827		
	0.4						3,812		
	0.3						3,786		
	0.2						3,719		
	0.2						3,592		
	0.3						3,821		
	0.3						3,806		
1886.									
	0.0						2,849	R., F. and M.	
	0.1						3,059		R = rod floats
	0.2						3,126		F = double floats.
	0.0						2,912		M = meter.
	0.0						2,980		
	—0.2						2,730		
	—0.2						2,706		
	—0.4						2,568		
	—0.5						2,439		
	—0.5						2,434		
	—0.6						2,343		
	—0.6						2,317		
	—0.6						2,312		
	—0.6						2,316		
	—0.6						2,315		
	—0.8						2,179		
	—0.9						2,165		
	—0.9						2,123		
	—1.0						2,089		
	—0.9						2,140		

Observations 1879-82 taken under Major D. C. Houston. Tabulation for 1879, C. of E. 1880, p. 1957; 1884, p. 1905; for 1880, C. of E. 1881, p. 2137; for 1881, C. of E. 1882, p. 2172; 1884, p. 1905; for 1882, C. of E. 1883, p. 1718.

(a) Report C. of E. 1876, Part II, pp. 266 and 276. These observations were taken by Gen. Warren.

(c) Major D. C. Houston Report C. of E. 1872, p. 133.

(d) Observed by Gen. Warren. Report C. of E. 1880, p. 1957.

(e) Observed by Major D. C. Houston. Report C. of E. 1880, p. 1957, and 1884, p. 1904.

(f) Gen. Warren's gauge whose zero is 0.'32 below the present gauge. Report C. of E. 1887, p. 2098.

(g) Dekorra gauge whose zero is 12.'32 below B. M. (1880) near mouth of Rocky Run. Report C. of E. 1883, p. 1718. It is at low water. Report C. of E. 1887, p. 2103.

(h) These discharges are the "means of all observed at each [gauge] reading." Observations taken under Capt. W. L. Marshall. Report C. of E. 1887, p. 2098. The Portage gauge readings have been reduced to the zero of Gen. Warren's gauge by adding 0.32 feet.

Rock River.

[Mouth 512 miles above Cairo.]

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1870.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Oct....11	*Extr. L. W.	.....	.....	.....	.....	.....	2,446	.....	At Dixon.
1879. May.....	†L. W.	.....	.....	.....	.....	.....	3,931	.....	At head of Carr's Isl.
June..	‡1.14 above L. W.	.....	.....	.....	.....	.....	5,316	.....	" " "
1891. Sept.. 1	§126.46	3,395	.....	.....	873	0.57	1,950	Surface and rod floats	About 2,000 ft. above Carr's Isl.
1	.....	.....	.....	.....	.....	0.54	1,837		
4	126.31	3,408	.....	.....	870	0.51	1,754		
4	.....	.....	.....	.....	.....	0.54	1,853		
4	.....	.....	.....	.....	.....	0.49	1,671		
7	126.35	3,303	.....	.....	870	0.52	1,709		
7	.....	.....	.....	.....	.....	0.55	1,818		
25	126.28	2,256	.....	.....	870	0.46	1,487		
25	.....	.....	.....	.....	.....	0 39	1,285		

* Col. Macomb, Report C. of E. 1871, p. 305. For location of section see Report C. of E. 1892, p. 2308.

† G. H. Boynton, Report C. of E. 1892, p. 2308.

‡ C. H. Stoddard, Report C. of E. 1892, p. 2308.

§ Capt. W. L. Marshall, Report C. of E. 1892, p. 2302.

Des Moines River.

[Mouth 381 miles above Cairo]

1867. April..29	.....	.....	.....	.....	.....	See note.	.....		

"Measurements on the Des Moines River, April 29, 1867, ascertained it to be about 35,000 cubic feet per second. The Des Moines was then 2½ feet below high water of April 24, 1867, on which day the discharge was not less than 42,000 cubic feet per second." Report Board of Engineers in Report C. of E. 1867, p. 321.

Illinois River.

[Mouth 222 miles above Cairo.]

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1867.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
	Above L.W.'67								
.....	0.0	.....	.....	.....	.....	.....	633	.....	Below La Salle.
1865.									
.....	*1.3	.....	.....	.....	.....	.....	2,788	F	At Willow Island.
.....	1.7	.....	.....	.....	.....	.....	2,509	F	Copperas Creek.
.....	1.5	.....	.....	.....	.....	.....	2,527	F	Spring Lake.
.....	1 3	.....	.....	.....	.....	.....	2,590	F	Frederick.
.....	4.3	.....	.....	.....	.....	.....	9,746	F	La Grange.
.....	3.9	.....	.....	.....	.....	.....	10,368	F	Naples.
.....	4.0	.....	.....	.....	.....	.....	9,134	F	Bedford.
1874.									
.....	†L. W.	.....	.....	.....	.....	.....	523	.....	9 miles below Joliet.
.....	†L. W.	.....	.....	.....	.....	.....	983	.....	At La Salle.
1879-80.									
.....	‡L. W.	.....	.....	.....	.....	.....	1,566	.....	Below Copperas Cr'k.
1881.									
April..26	19.3	25,785	.... ..	....	.....	1 52	39,232	F	4 miles above mouth.
May...19	15.2	21,965	.....	.....	954	1 52	33.272	F	
June.. 8	8.8	16,155	.....	.....	881	0.91	14,683	F	
Aug... 3	.....	14,338	.....	.....	858	0.40	5,670	F	
1887.	Above L.W.'79								
.....	0.0	2,800	.....	.....	....	0.60	1,685	F	At La Grange lock.
Aug.... 1	0.2	2,926	.....	.....	.....	0.60	1,760	F	Tabulation in Rept. C. of E. 1890, p. 2443.
1888.									
Dec...2	2.0	3,174	.....	.....	.....	1.28	4,054		Capt. Marshall.
Dec....21	2.0	3,145	.....	.....	.....	1.33	4,178		
Dec....31	3.0	3,776	.....	.....	.....	1.54	5,811		
1889.									
Feb.... 4	4.3	4 735	.....	.....	....	1.76	8,322		
March. 8	7.6	7,208	.....	.....	....	2 55	18 412		
March.11	8.4	7,664	.....	.....	.....	2.57	19,717		F = double floats.
March.25	6.7	6,394	.....	.....	.....	2.26	14,439		M = meter.
March.30	5.8	5,805	.....	.....	.....	2.05	11,924		
April.. 8	5.0	5.289	... ...	.....	....	1.85	9,796		
April .22	7.7	7,182	.....	.....	.....	2.41	17,165		
May...20	5.4	4,512	.....	.....	.....	1.94	8,765		
May...30	27.0	6,214	.....	.....	.....	2.01	12,495		‡Backwater from the Mississippi River.
June... 9	10.0	9,813	.....	.....	.....	2.52	24,730		
July... 9	10.3	11,990	.....	.....	.....	2.05	24.620		
July...15	8.4	9,901	.....	.....	.....	1.86	18,389		
	Above assumed L. W.								
Oct ...24	0.6	1,524	.....	.....	.....	0.77	1,168		At Ottawa. Captain Marshall, C. of E. 1890, p. 2536. These observations are arranged according to gauge heights, as published by Capt. Marshall.
Oct .. 28	0.6	1,549	.....	.....	.....	0.89	1,374		
Oct.... 9 / Oct ...17	0.6	1,540	.....	.....	.....	0.78	1,201		
Oct.... 3	0.7	1,468	... ...	.....	.....	0 92	1,352	M	
May...27 / Oct....21	0.7	1,644	.....	.....	.....	0.89	1,462		
Oct.... 1	0.7	1,485	.. ....	.....	.....	0.85	1.252		
Oct.... 7	0 7	1,554	.. ....	.....	.....	0.82	1,300		
Oct....14	0.8	1,612	.....	.....	.....	0.88	1,417		
May....22	0.8	1,819	.....	.....	.....	0.91	1,655		* Gen. J. H. Wilson, Report C. of E. 1869, p. 254, and 1890, p. 2445.
Sept....27	0 8	1.631	.....	.....	.....	0.86	1,402		
Sept.... 8	0.8	1,762	... .	.....	.....	0.79	1,385		† Col. J. N. Macomb, Report C. of E. 1875, Part 2, p. 529.
Sept....23	0.8	1,813	.....	.....	.....	0.86	1,552		
May....30 / Aug...30	0.8	1,786	.....	.....	.....	0.94	1.672		‡ Capt. Marshall, Report C. of E. 1890, p. 2445.
May....11	0 9	1,870	.....	....	.....	1.02	1,900		
May...20	0.9	1,877	.....	.....	.....	1.01	1,894		
Sept...23	0.9	1,877	.....	.....	.....	0.84	1,584		
Sept...21	0.9	1.817	.....	.....	.....	0 88	1,601		
Nov.... 2	0.9	1,915	.....	.....	.....	1.00	1,913		
Aug...27	1.0	1,862	.....	.....	.....	0 93	1,731		
May....14	1.0	1,939	.....	.....	.....	1.04	2,000		
May..... 7 / Aug....24	1.0	1,926	.....	.....	.....	1.03	1,987		
May....16	1.0	1,907	.....	.....	.....	1.09	2,087		‖ Mean discharge for two days.

The observations of 1881 taken under Secretary M. R. C. were not previously published. The tabulated gauge readings are those of the Wheeler's Ferry gauge whose zero was at L. W. of 1874. For Grafton gauge readings see pp. 22-24.

ILLINOIS RIVER.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1889.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Sept...17	1.0	1,999	.....	.....	.....	1.15	2,294	M	Ottawa continued.
Nov...18	1.0	1,907	.....	.....	.....	1.06	2.031	M	M = meter.
Aug...21	1.0	1,966	.....	.....	.....	1.04	2.039	M	
May... 3	1.1	1,936	.....	.....	.....	1.19	2,298	M	
Sept... 5	1.1	2,016	.....	.....	.....	1.02	2,043	M	
April..30	1.2	1,972	.....	.....	.....	1.26	2,491	M	
Aug...19	1.2	2,032	.....	.....	.....	1.10	2,233	M	
Nov... 9 / Nov...15	1.2	2,053	.....	.....	.....	1.18	*2,429	M	* Mean discharge for two days.
Aug...12	1.3	2,049	.....	.....	.....	1.26	2,572	M	
Aug...16	1.3	2,066	.....	.....	.....	1.24	2,569	M	
Nov...25	1.3	2,069	.....	.....	.....	1.30	2,723	M	
Nov....12 / Nov...21	1.3	2,100	.....	.....	.....	1.29	*2,702	M	
Sept...13	1.4	2,151	.....	.....	.....	1.27	2,728	M	
Aug....14	1.4	2,111	.....	.....	.....	1.36	2,873	M	Ottawa is 283 miles above mouth.
April..26	1.4	2,147	.....	.....	.....	1.46	3,134	M	
July...11	1.5	2,121	.....	.....	.....	1.47	3,119	M	
Aug.... 9	1.5	2,178	.....	.....	.....	1.48	3,214	M	
July... 9	1.6	2,184	.....	.....	.....	1.57	3,417	M	
Aug.... 7	1.6	2,210	.....	.....	.....	1.54	3,414	M	
July...13	1.6	2,208	.....	.....	.....	1.63	3,591	M	
Nov... 5	1.7	2,259	.....	.....	.....	1.50	3,382	M	
July... 8 / Aug.... 3	1.7	2,241	.....	.....	.....	1.65	*3,658	M	
Sept.... 3	1.9	2,359	.....	.....	.....	1.60	3,763	M	
April..23	1.9	2,347	.....	.....	.....	1.93	4,538	M	
July....6	1.9	2,365	.....	.....	.....	1.87	4,431	M	
July...27	2.0	2,366	.....	.....	.....	1.89	4,470	M	
July... 1	2.1	2,408	.....	.....	.....	2.00	4,826	M	
Aug.... 1	2.1	2,414	.....	.....	.....	2.01	4,860	M	
July... 3 / July...25	2.2	2,475	.....	.....	.....	2.07	*5,231	M	
June...27	2.5	2,556	.....	.....	.....	2.31	5,905	M	
July...30	2.6	2,597	.....	.....	.....	2.35	6,095	M	
July...23	2.6	2,634	.....	.....	.....	2.39	6,307	M	
June..26	2.9	2,765	.....	.....	.....	2.61	7,215	M	
June... 5	3.1	2,945	.....	.....	.....	2.67	7,853	M	
June...14	3.2	2,897	.....	.....	.....	2.74	7,944	M	
July...20	3.2	2,878	.....	.....	.....	2.74	7,884	M	
June..13	3.6	3,098	.....	.....	.....	3.18	9,705	M	
July...18	3.8	3,129	.....	.....	.....	3.29	10,294	M	
June..24	3.8	3,208	.....	.....	.....	3.29	10,552	M	
June... 3	3.8	3,293	.....	.....	.....	3.26	10,746	M	
June...10	3.9	3,271	.....	.....	.....	3.35	10,953	M	
June...21	5.0	3,708	.....	.....	.....	4.23	15,691	M	
June...17	5.1	3,795	.....	.....	.....	4.19	15,911	M	
July...16	5.2	3,826	.....	.....	.....	4.51	17,250	M	
Oct....22	0.6	3,794	.....	.....	.....	0.41	1,504	M	At Peru, 268 miles above mouth.
Oct....10	0.7	3,695	.....	.....	.....	0.37	1,382	M	Capt. W. L. Marshall, C. of E. 1890, p. 2587.
Oct....15	0.8	3,979	.....	.....	.....	0.37	1,472	M	Gauge readings referred to gauge whose zero was 0.20 feet below low water of 1888.
May...28	0.8	4,026	.....	.....	.....	0.46	1,834	M	
Oct....29	0.8	3,909	.....	.....	.....	0.34	1,316	M	
Oct.... 4	0.8	3,998	.....	.....	.....	0.33	1,303	M	
Oct....18	0.8	3,977	.....	.....	.....	0.39	1,540	M	
Oct....26	0.8	3,954	.....	.....	.....	0.36	1,408	M	
Oct .. 2	0.9	4,048	.....	.....	.....	0.35	1,404	M	
May...10 / May...21	0.9	4,097	.....	.....	.....	0.56	*2,313	M	
May...18	1.0	4,183	.....	.....	.....	0.56	2,339	M	
Aug....20	1.0	3,979	.....	.....	.....	0 74	2,930	M	
Sept...28	1.1	4,108	.....	.....	.....	0.37	1,510	M	
May....15 / Sept....24	1.1	4,122	.....	.....	.....	0.56	*2,243	M	

ILLINOIS RIVER.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1889.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Aug...17	1.1	4,035				0.60	*2,407	M	Peru continued.
Sept... 2									
May... 6	1.2	4,181				0.58	*2,440	M	M = meter.
Sept... 4									
Aug...29	1.2	4,111				0.38	1,543	M	
Aug...15	1.3	4,114				0.74	3,271	M	
Sept...20	1.3	4,276				0.55	2,348	M	
May...31	1.3	4,191				0.55	*2,298	M	
Aug...26									
Aug...23	1.4	4,126				0.48	1,972	M	* Mean discharge for two days.
Aug...13	1.4	4,133				0.85	3,530	M	
May... 2	1.4	4,324				0.65	*2,808	M	
Sept...18									
Aug...10	1.5	4,222				0.82	3,460	M	
Sept...16	1.5	4,369				0.54	3,372	M	
Nov...19	1.6	4,104				0.52	2,135	M	
Aug... 8	1.7	4,363				0.87	3,799	M	
Nov...26	1.7	4,301				0.57	2,443	M	
Nov...16	1.8	4,315				0.62	2,673	M	
April..29	1.8	4,552				0 82	3,735	M	
Sept.... 6	1.9	4,357				0.75	3,283	M	
Nov...11	1.9	4,368				0 69	3,009	M	
Aug.... 6	1.9	4,491				0.96	4,322	M	
April..12	2.0	4,578				0.94	4,295	M	
Nov...23	2.0	4,406				0.78	3,453	M	
Sept....12	2.0	4,633				0.74	3,423	M	
April.. 9	2.1	4,669				0.86	4,008	M	
April..27	2.2	4,794				0.93	4,446	M	
Nov.... 4	2.2	4,544				1 05	4,789	M	
Nov.... 7	2.2	4,524				0.90	4,080	M	
July...10	2.2	4,507				0.84	3,789	M	
Aug.... 2	2.4	4,755				1.12	5,338	M	
April..25	2.5	4,992				1.07	5,338	M	
July... 8	2.7	4,774				1.07	*5,112	M	
July...29									
April..16	2.7	4,999				1 18	5,902	M	
April.. 5	2.8	5,010				1.27	6,340	M	
Sept... 9	2.8	5,014				1 02	5,132	M	
April..19	2.9	5,116				1.31	6.693	M	
July...30	2.9	4,905				1.28	6,302	M	
July...26	3.0	4.918				1.09	5,358	M	
July...31	3.0	4,981				1.29	6,441	M	
April.. 2	3.0	5,112				1.35	6 917	M	
July...24	3.4	5,149				1.21	6.248	M	
June... 6	3.6	5,326				1.43	7,602	M	
July... 5	3 6	5,192				1.14	5,901	M	
April..20	3.8	5,498				1.81	9.965	M	
April..21	3.8	5,544				1.73	9,571	M	
July... 2	4.0	5,369				1.09	5,>64	M	
July.. 22	4.0	5,418				1.41	7,650	M	
June... 4	4.4	5,657				2.14	*12,066	M	
July...15									
June...29	4 6	5,686				1.00	5 670	M	
June...15	4.7	5.831				1.66	9,704	M	
June...14	4.8	5,868				1.67	9,805	M	
July...19	4.8	5,688				1.71	9,740	M	
June...27	5.5	6,201				1 20	7.439	M	
June...12	5.6	6,267				2.28	14,322	M	
July...16	5.9	6.255				2.88	17,997	M	
June...26	5.9	6,360				1.34	8,519	M	
July...17	6.1	6,323				2.44	15,437	M	
June...25	6.5	6.721				1 60	10,756	M	
June...18	7.4	7,026				2.77	19,480	M	
June...22	7.9	7,236				2 50	18,108	M	

ILLINOIS RIVER.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1889.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
	Above L.W. '79								At Kampsville.
April..10	4.0	7,812	.....	.....	.....	1.40	10,275		M = meter.
April.. 9	4.2	7,345	.....	.....	.....	1.37	10,052		F = double floats.
April.. 1	4.6	7,770	.....	.....	.....	1.48	11,548		R = rod floats.
July...11	7.5	10,859	.....	.....	.....	2.20	23,892		
June...21	9.0	12,901	.....	.....	.....	2.41	31,068		
June...22	9.2	13,084	.....	.....	.....	2.43	31,855	M	
May. .31	†10.5	14,516	.....	.....	.....	1.47	21,344		† Back water from the Mississippi River.
1890.									
Jan....18	12.8	13,069	.....	.....	.....	2.55	33,295		At La Grange lock.
1891.									
Oct....18	—0.2	2,321	.....	.....	.....	0.81	1,878		At Kampsville.
Oct ...20	—0.2	2,224	.....	.....	.....	0.65	1,453		a. m.
Oct....20	—0.2	2,245	.....	.....	.....	0 67	1,506		p. m.

Capt. W. L. Marshall Tabulation for 1889 and 1890, C. of E. 1890, p. 2443.
Capt. W. L. Marshall. Tabulation for 1891, C. of E. 1892, pp. 2263-66. Oct. 18, two sets of observations were taken which agreed within a fraction of a cubic foot.

MISSOURI RIVER.

[Mouth 196 miles above Cairo.]

Sioux City, Iowa.

1878.									
Sept....17	668.9	8,643	7.6	.....	1,180	3.51	30,319	F	All gauge readings are referred to the St. Louis City directrix which is 433 97 feet above the Cairo datum plane.
18	668.9	8,453	7.5	.....	1,180	3.56	30,059	F	
19	668.9	8,613	7.6	.....	1,125	3.46	29,827	R	
21	669.3	8,398	7.4	.....	1,127	3.52	29,535	R	
26	669.2	7,958	7.1	.....	1,125	3.46	27,535	R	
30	669.2	8,107	7.0	.....	1,150	3.22	26,136	R	
Oct.... 2	669.0	7,779	7.0	.....	1,115	3.31	25,748	R	Observations and reductions, 1878 and 1879, under Major Charles R. Suter. Tabulation, Report C. of E. 1887, p. 3090.
3	668.9	7,565	6.8	.....	1,120	3.41	25,789	F	
4	668.9	7,743	6.9	.....	1,120	3.28	25,374	R	
5	668.9	7,600	6.8	.....	1,125	3.12	23,606	R	
7	668.6	7,054	6.3	.....	1,125	3.13	22,065	R	
9	668 5	7,194	6.4	.....	1,120	3.15	22,647	R	
11	668.5	7,551	6.7	.....	1.123	3.04	22,940	R	
Nov.... 1	668.3	5,951	5.3	.....	1,125	3.53	20,995	R	
1879.									
July... 1	677.7	26,284	18.9	.....	1,390	7.48	196,712		The section of 1878 and 1879 was 700 feet below the mouth of Perry Creek.
2	677.6	26,263	.....	.....	.....	7.43	195,068		
5	676.9	24,850	.....	.....	.....	6.34	157,573		
7	676.2	24,830	.....	.....	.....	6.51	161,533		
9	676.1	23,068	.....	.....	.....	5.96	137,443		803 Miles above mouth of Missouri River.
10	676.2	20,497	.....	.....	.....	6.05	124,040		
14	675.1	20,394	.....	.....	.....	5.32	108,495		
15	675.0	20,120	.....	.....	.....	5.24	105,542		
16	675.0	19,967	.....	.....	.....	5.27	105,262		
22	673.9	16,943	.....	.....	.....	5.20	88,058		
23	673.8	15,840	.....	.....	.....	5.37	85,020		
24	673 4	16,387	.....	.....	.....	4 97	81,408		
25	673.1	15,733	11.6	.....	1,335	5 12	80,676	F	
28	673.6	18,654	.....	.....	.....	5.32	99,222		
30	674.1	17,706	.....	.....	.....	5.68	100,518		
Aug... 1	673.8	14,871	10.7	.....	1,390	6.27	93,184		
8	671.1	10,927	.....	.....	.....	5.33	58,259		
13	670.6	10.993	.....	.....	.....	4.22	46,371		
14	670.4	10,912	.....	.....	.....	4.18	45,570		
15	670.4	10,705	.....	.....	.....	3.76	40,252		
20	669.8	9,007	.....	.....	.....	4.12	37,282		
21	669.8	7,930	.....	.....	.....	4.29	34,022		
26	669.6	8,138	.....	.....	.....	3.86	31 440		
Sept.. 6	668.7	6,425	.....	.....	.....	3.85	24,713		
13	668.2	6,354	.....	.....	.....	3.59	22.810		
19	667.7	5,548	5.1	.....	1,080	3.56	18,741		

Missouri River.

[Mouth 196 miles above Cairo.]

Omaha, Neb.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1877.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
1877.	551.9	5,608	.....	.....	.....	3.29	20,178	F	F = double floats. R = rod floats.
1878.									
Oct..... 1	553.5	8,644	8.6	.....	1,000	3.68	31,866	F	
2	553.4	8,717	9.1	.....	955	3.40	29,672	F	Observation of 1877 under Major C. R. Suter. Report C. of E. 1878, p. 667.
*3	553 3	7,285	8.6	.....	845	3.62	26,358	F	
10	552 8	6,582	8.1	.....	810	2.66	17,426	F	
11	552 8	7,332	8.9	.....	820	2.92	21,597	F	
†12	552.7	5,426	8.1	.....	670	4.25	23,070	F	Observations, 1878-82, under Major C. R. Suter. Tabulation, Report C. of E. 1887, p. 3089. Report on observations, ibid. p. 3082.
14	552 8	5,312	8.6	.....	620	3.50	19,608	F	
18	552.7	5,858	8.6	.....	680	4.15	24,349	F	
22	552.6	6,850	9.3	.....	740	2.78	19,051	F	
†28	552.7	4,397	10.1	.....	434	5.60	24 638	F	
Nov ... 6	552.7	5,426	11.2	.....	485	3.86	20,969	F	
9	552.7	4,892	10.4	.....	470	4.62	22,602	F	
*12	552.7	5,316	7.9	.....	675	4.15	22,091	F	* Probably a change of section.
14	552.7	5,838	8.6	.....	675	4.17	24,309	F	
15	552.7	6,344	9.4	.....	675	3.83	24,309	F	† Section changed.
16	552.7	7,179	10.6	.....	680	3.44	24,733	F	
†19	552.7	6,745	5.4	.....	1,260	3.40	22,946	F	Omaha is 668 miles above mouth.
†21	552.7	4,658	7.8	.....	595	5.11	24,006	F	
22	552.6	4,585	7.7	.....	595	5.52	25,330	F	
1879.									
Aug....26	553.7	7,681	8.2	.....	932	4.91	37,717	F	
30	553.4	6,789	7.3	.....	920	4.53	30,610	F	
Sept.... 2	553.0	7,368	8.1	.....	910	3.72	27,437	F	
4	552.9	7,351	8.3	.....	890	3.65	26,811	F	
†22	551.6	5,479	5.2	.....	1,055	3.23	17,716	F	
27	551.4	5,171	5.3	.....	980	3.16	17,336	F	
Oct..... 3	551.6	5,502	4.5	.....	1,238	3.13	17,240	F	
10	551.6	4,849	5.0	.....	973	3.01	14,612	F	
1880.									
April..15	554.3	9,880	11.9	.....	833	4.70	46,466	R	Allgauge readings are referred to the St. Louis City directrix which is 433.97 feet above the Cairo datum plane.
22	555.2	9,421	10.2	.....	833	6.12	57,486	R	
May...13	553.5	7,477	5 9	.....	1,270	5.23	39,133	F	
†5	553.2	5,919	7.3	.....	770	5.67	33,558	F	
Nov.... 1	551.7	4,582	5.8	.....	797	4.17	19,112	F	
1882.									
June13-15	556.4	13,927	12 4	.....	1,119	7.85	109,398	F	
†13-15	556.4	14,502	13.3	.....	1,093	7.82	113,487	F	
July..†10	557.8	16,168	13.9	.....	1,160	7.01	113,406	F	
11-12	558.0	16,659	14.4	.....	1,160	8.12	135,292	F	
19	557.4	13,898	12.0	.....	1,160	7.70	107,034	F	
22	556.3	12,541	10.9	.....	1,160	6.43	80,673	F	
25	555.4	12,385	11.3	.....	1,097	5.55	68,790	F	
26	555.1	11,455	10.4	.....	1,096	5.66	64,834	F	
27	555.2	11,102	10.2	.....	1,093	6.10	67,747	F	
Aug....28	552.8	7,823	7.5	.....	1,045	4.03	31,566	F	
29	552.7	7,922	7.7	.....	1,034	4.22	33,483	F	
30	552.7	7,584	7.3	.....	1,035	4.11	31,197	F	
31	552.6	7,953	7.6	.....	1,048	4.35	34,680	F	
Sept.... 1	552.5	7,636	7.3	.....	1,046	4.01	30,649	F	
2	552.4	7,429	7.1	.....	1,049	4.39	32,680	F	
4	552.2	6,853	6.6	.....	1,041	4.27	29,538	F	
5	552.1	7,246	6.9	.....	1,049	3.99	28,933	F	
11	551.6	7,145	6.8	.....	1,045	3.30	23,628	F	
12	551.5	7,270	6.9	.....	1,051	3.58	24,631	F	
13	551.4	7,261	7.0	.....	1,044	3.39	24,615	F	
16	551.4	6,731	6.4	.....	1,044	3.62	24,387	F	
26	551.1	6,251	6.0	.....	1,060	3.55	21,909	F	
27	551.1	4,920	4.7	.....	1,055	3.42	16,837	F	
28	551.1	5,802	5.5	.....	1,053	3.39	19,682	F	
†29	551.1	5,752	5.9	.....	974	3.43	19,360	F	
30	551.1	6,673	7.3	.....	914	3.12	20,816	F	
Oct.... 2	551.0	6,030	6.7	.....	900	3.35	21,122	F	

Missouri River.

[Mouth 196 miles above Cairo.]

Nebraska City, Neb.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1878.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
May... 10	499.9	13,173	7.0	.....	1,890	3.69	48,582	F	F = double floats.
24	501.6	18,530	8.4	.....	2,195	4.96	91,950	F	
29	502.0	23,040	9.8	.....	2,340	4.96	114,300	F	Section at mouth of Squaw Creek. Observations under Major C. R. Suter. Tabulation, Report C. of E. 1887, p. 3088. Report on obeservations, ibid. 3081.
31	501.8	21,180	10.2	.....	2,060	4.95	104 680	F	
June... 2	501.1	20,040	9.9	.....	2,020	4.44	88,880	F	
5	500.6	20,200	9.9	.....	2,045	3.70	74,760	F	
7	500.3	14,900	10.0	.....	1,490	4.18	62,240	F	
10	500.3	14.280	9.7	.....	1,470	4.23	60.320	F	
13	501.9	18,220	8.5	.....	2,135	6.41	116,840	F	
15	502.2	18,580	8.6	.....	2,160	6.36	118,200	F	
20	504.6	31,340	11 2	.....	2,800	6.37	199,600	F	Nebraska City 609 miles above mouth.
22	504.9	30,580	10.9	.....	2,810	6.84	209,280	F	
24	505.2	30,340	10.8	.....	2,820	6.64	201,640	F	
26	505.4	29,140	10.4	.....	2,810	7.37	214 680	F	
28	505.4	29,800	10.5	.....	2,830	7.10	229,640	F	
30	505.5	28,660	10.1	.....	2,825	7.32	209,800	F	
July... 3	505.3	27,480	9.7	.....	2,840	6.04	175,880	F	
7	504.1	28,440	10.0	.....	2,850	5.03	143,120	F	
10	503.8	28,840	10.1	.....	2,850	4.35	125,400	F	
12	503.8	30,560	10.8	.....	2,840	4.91	150,040	F	
14	503.8	30,360	10.8	.....	2,845	4.68	143,000	F	
17	503.8	28,440	10.0	.....	2,850	5.14	146,200	F	
19	503.1	26,580	9.3	.....	2,850	4.65	123,480	F	
21	502.7	23,900	8.4	.....	2,840	4.55	108,600	F	
24	502.0	20,920	7.4	.....	2,840	4.25	88,800	F	
31	501.2	19,860	7.0	.....	2,825	3.65	72,600	F	
Aug....12	500 0	14,760	5.6	.....	2,660	3.41	50,370	F	
24	498.9	11,565	5.2	.....	2,240	3.97	40,950	F	
28	498.8	11,025	4.9	.....	2,260	3.13	34,530	F	
31	498.6	10,860	4.7	.....	2,320	3.28	35,730	F	
Sept... 4	498.4	10,710	3.8	.....	2,800	2.92	31,260	F	
7	498.2	9,750	3.9	.....	2,480	3 10	30,270	F	
26	497.2	8,920	5.7	.....	1,560	2.42	21,610	F	

St. Joseph, Mo.

1875.									
*June. 25	393.6	38,187	.....	.....	.....	5.02	208,618	.....	* Day of month determined by comparison with daily stages reported by the Missouri River Commission.
*Nov.. 20	383.8	12,173	.....	.....	.....	2.32	28,542	.....	
1878.									
Oct.... 8	386.4	15,300	12.5	.....	1,220	2.61	39,880	F	
9	386.4	15,600	12.6	.....	1,288	2.42	37,745	F	
† 10	386.4	13,900	11.9	.....	1,170	2.47	34,335	F	†Probably a change of section.
11	386.5	14,200	12.1	.....	1,175	2.60	36,863	F	
12	386.5	13,500	11.5	.....	1,175	2.31	31,086	F	

Observations of 1875 under Major C. R. Suter. Report C. of E. 1876, Part I, pp. 630, 632, respectively.

Section of 1878 was 2.2 miles above the St. Joseph Bridge, 482 above mouth. Observations under Maj. C. R. Suter. Tabulation, Report C. of E. 1887, p. 3088.

Missouri River.

[Mouth 196 miles above Cairo.]

Atchison, Kas.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
June... 7	361.2	17,206	14.7	.....	1,169	3.89	66,899	F	F = double floats.
8	361.1	17,017	14.6	.....	1,169	3.59	61,062	F	
9	361.0	16,403	14.1	.....	1,161	3 89	63,885	F	Section was 1700 feet below the Atchison bridge. Observations under Maj. C. R. Suter. Tabulation, Report C. of E. 1887, p. 3067. All gauge readings are referred to the St. Louis City directrix which is 488.97 feet above the Cairo datum plane.
10	361.3	16,018	13.8	.....	1,163	5.98	63,687	F	
12	361.6	16,800	14.4	.....	1,164	4.17	70,113	F	
13	362.5	17,592	14.9	.....	1,178	4.88	85,847	F	
14	363.9	18,737	14.6	.....	1,283	5.41	101,298	F	
16	364.1	19,097	14.9	.....	1,284	5.27	100,621	F	
17	364.3	19,001	14.8	.....	1,286	5.14	97,609	F	
19	365.7	23,825	17.9	.....	1,334	6.50	154,972	F	
21	366.8	23,930	17.8	.....	1,342	7.32	175,168	F	
22	366.9	23,773	17.5	.....	1,356	7.27	172,848	F	
28	368.2	27,848	19.8	.....	1,408	6.70	186,543	F	
29	369.0	28,960	20.6	.....	1,409	6.80	196,810	F	
30	368.8	29,713	21.0	.....	1,413	7.30	216,834	F	
July... 1	368.8	29,663	21.0	.....	1,412	7.37	218,526	F	Atchison 446 miles above mouth.
3	369.1	30,777	21.8	.....	1,411	7.27	223,679	F	
4	369.0	27,929	19.8	.....	1,414	6.93	193,525	F	
6	364.0	28,843	20.6	.....	1,402	5.94	171,242	F	
7	367.4	27,111	19.7	.....	1,376	6.06	164,275	F	
8	367.0	27,195	20.1	.....	1,354	6.01	163,378	F	
11	366.0	26,091	19.5	.....	1,341	6.03	131,149	F	
12	365.7	26,029	19.4	.....	1,342	5.39	140,206	F	
13	365.8	25,917	19.3	.....	1,344	5.17	134,049	F	
14	366.0	27,004	20.1	.....	1,344	5.20	140,349	F	
17	366.0	25,516	18.9	.....	1,347	5.78	147,606	F	
18	366.2	24,471	18.2	.....	1,347	6.04	147,786	F	
21	365.0	22,222	17.2	.....	1,291	5.04	112,053	F	
22	364 7	21,992	17.0	.....	1,291	4.63	101,769	F	
24	364.0	20,904	16.4	.....	1,278	4.27	89,192	F	
25	363.5	20,628	16.4	.....	1,254	4.18	86,208	F	
26	363.2	20,372	16 3	.....	1,248	4.18	85,112	F	
27	363.0	19,405	15.6	.....	1,244	4.08	79,250	F	
28	362.8	18,797	15.2	.....	1,237	4 24	79,689	F	
29	362.6	18,175	14.8	.....	1,231	4.30	78,100	F	
31	362.6	17,180	14.0	.....	1,226	4.61	79,169	F	
Aug....24	358.8	11,818	11.2	.....	1,054	3.30	38,966	F	
25	358.8	11,241	10.8	.....	1,044	3.40	38,269	F	
26	358.7	11,935	11.3	.....	1,059	3 12	37,248	F	
28	358.6	11,731	11.1	.....	1,056	3.27	38,406	F	
29	358.6	11,973	11.2	.....	1,064	3.19	38,213	F	
30	358.5	11,642	11.0	.....	1,061	3.39	39,456	F	
31	358.5	11,759	11.1	.....	1,061	3.26	38,377	F	
Sept.... 1	358.5	11,540	10.9	.....	1,059	3.23	37,323	F	
2	358.4	10,890	10.3	.....	1,060	3.17	34,571	F	
4	358.3	10,371	9.8	.....	1,058	3.32	34,413	F	
5	358.2	10,496	10.0	.....	1,054	3.24	34,026	F	
6	358.1	10,259	9.8	.....	1,048	3.13	32,161	F	
7	358.0	10,306	9.8	.....	1,048	3.17	32,730	F	
8	358.0	10,138	9.7	.....	1,043	3.06	31,003	F	
9	357.9	10,709	10.3	.....	1,043	2.97	31,766	F	
11	357.7	9,974	9.6	.....	1,039	2.92	29,159	F	
12	357.6	10,164	9.8	.....	1,036	2.91	29,561	F	
13	357.5	10,601	10.2	.....	1,035	2.88	30,529	F	
14	357.4	10,265	10.0	.....	1,031	2.74	28,166	F	
19	357.1	9,916	9.7	.....	1,022	2.67	26,494	F	
20	357.0	9,354	9.1	.....	1,023	2.77	25,928	F	
21	357.0	9,349	9.2	.....	1,021	2.65	24,783	F	
22	357.0	9,351	9.2	.....	1,018	2.67	24,943	F	
23	356.9	9,001	9.0	.....	1,012	2.72	24,514	F	
25	356.8	8,860	8.7	.....	1,014	2.58	22,899	F	
26	356.7	8,847	8.7	.....	1,014	2.60	23,016	F	
27	356.7	8,845	8.7	.....	1,014	2.60	22,993	F	
29	356 7	8,838	8.7	.....	1,013	2.63	23,291	F	
30	356.7	8,858	8.7	.....	1,013	2.64	23,356	F	
Oct.... 2	356.7	8,883	8.8	.....	1,012	2.57	22,858	F	
Nov....29	355.9	7,318	9.2	.....	796	2.59	18,980	F	

Missouri River.

[Mouth 196 miles above Cairo.]

Kansas City, Mo.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1883.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
June...23	326.3	54,981	25.2	.....	2,184	6.20	340,818	F	F = double floats.
28	327.5	59,544	27.3	.....	2,184	6.22	370.295	F	
30	326.4	58,532	26.7	.....	2,193	5.91	345,912	F	Section 6200 feet below the bridge, which is about 1½ miles below mouth of the Kaw.
July... 2	325.3	54,935	25.0	.....	2,195	5.86	322,144	F	
5	322.2	48,963	22.2	.....	2,201	5.24	256,506	F	
6	321.9	48,917	22.2	.....	2,203	4.98	243,730	F	
7	322.2	50,288	22.8	.....	2,204	5.20	261,614	F	
9	322.0	49,685	22.6	.....	2,208	5 31	263,622	F	Observations under Major C. R. Suter. Tabulation, Report C. of E. 1887, p. 3085.
10	322.0	48,759	22.1	.....	2,208	5.15	251,090	F	
11	322.2	49,213	22.3	.....	2,207	4.97	244 575	F	
12	323.2	52,090	23 6	.....	2.207	5.43	282,709	F	
17	321.1	44,098	20.0	.....	2,201	4.98	219,548	F	All gauge readings are referred to the St. Louis City directrix which is 433.97 feet above the Cairo datum plane.
18	320.5	43,325	19.7	.....	2,202	4.64	200,931	F	
20	319 1	39,961	18.2	.....	2,198	4 33	175,066	F	
21	318.6	39,242	17.8	.....	2,198	4 21	165,277	F	
24	317.4	32,623	14.9	.....	2,189	4 07	132,670	F	
*27	316.5	29,510	22.9	.....	1,287	3.89	114,700	F	
28	316.5	29,928	23.2	.....	1,287	3.94	117,952	F	
31	317.1	29,310	22.5	.....	1,301	4.16	121,909	F	* A new section 3100 ft. below the bridge was used from this time.
Aug... 1	316.4	29,040	23.1	.....	1,255	4.11	119,354	F	
2	315.8	28,075	22.5	.....	1,250	3.81	106,880	F	
3	315.4	26,905	21.6	.....	1,247	4.02	108,427	F	
4	315.4	27,440	22.0	.....	1,249	4.06	111.505	F	Kansas City is 386 miles above mouth.
6	315.3	26,690	21.4	.....	1.249	3.94	105,148	F	
7	314.6	25,210	20.5	.....	1,232	3.69	93,058	F	
8	314.3	25,218	20.5	.....	1,232	3.57	90,074	F	
11	314.3	24,328	19.8	.....	1,231	3.66	88,935	F	
13	314.0	24,253	19.7	.....	1,230	3.46	84,023	F	
14	314.2	25,059	20.3	.....	1,235	3.77	94,467	F	
16	314.2	23,256	18.8	.....	1,235	3.82	88,826	F	
17	314.2	22,936	18.6	.....	1,235	3.85	88,360	F	
20	316.0	26,490	21.1	.....	1,255	4.59	121,608	F	
23	314.8	23,667	19 0	.....	1,243	4.13	97,817	F	
24	314.2	22,704	18.5	.....	1,230	3.95	89,687	F	
27	313.3	21,812	17.9	.....	1,221	3.68	80,293	F	
28	313.0	20,840	17.1	.....	1,220	3.43	71,486	F	
30	312.5	20,862	17.1	.....	1,220	3.25	67,850	F	
Sept.... 1	312.1	20,547	17.0	.....	1,207	3.20	65,694	F	
3	311.8	19,624	16.2	.....	1,210	3.00	58,974	F	
5	311.4	19,248	16.0	.....	1,205	2.97	57,186	F	
6	311.1	18,964	15.7	.....	1,208	2 80	53,139	F	
7	310.8	18,805	15 6	.....	1,204	2.80	52,727	F	
10	310 2	18,571	15.5	.....	1.201	2.50	46,340	F	
11	310.1	18,609	15.5	.....	1,202	2.53	47,043	F	
12	310.0	18,764	15.6	.....	1,201	2.56	48,078	F	
13	309.7	18,247	15.2	.....	1,201	2.43	44,305	F	
14	309.6	18,108	15.0	.....	1,203	2.41	43,593	F	
15	309.5	17,499	14.6	.....	1,195	2 39	41,781	F	
17	309.4	17,301	14.5	.....	1.191	2.33	41,336	F	
19	309.3	16,993	14.3	.....	1,189	2.44	41,490	F	
20	309.2	16,551	13.9	.....	1,189	2.32	38,440	F	
21	309.0	16,570	13.9	.....	1,189	2.47	41,878	F	
24	309.0	15,851	13.3	.....	1,192	2.43	38,577	F	
26	309.1	15,983	13.4	.....	1,193	2.64	42,210	F	
27	309.3	16,062	13.5	.....	1,193	2.68	43,020	F	
28	309.4	15,820	13.3	.....	1,193	2 56	40,521	F	
Oct.... 5	309 7	15,950	13.3	.....	1,200	2.75	43,911	F	
6	309.7	15,780	13.1	.....	1,200	2.74	43,156	F	
9	309.9	15,799	13.2	.....	1,201	2.74	43,217	F	
11	309.6	15,440	12.9	.....	1,196	2.62	40,401	F	
Nov.... 6	310.2	15,577	12.9	.....	1,205	3.23	50,348	F	

Missouri River.

[Mouth 196 miles above Cairo.]

St. Charles, Mo.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1878.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Dec....12	7.5	10,900	8.1	.....	1,346	3.27	35,660	F	Section about 600 feet above the bridge.
1879.									
Feb..... 6	8.2	11,075	8 0	.....	1,386	3.61	40,000	F	Observations under Major C. R. Suter.
8	7.8	10,295	7.8	.....	1,357	3.53	36,370	F	Tabulation, Report
13	8.7	11,390	8.2	.....	1,396	4.04	45,990	F	C. of E. 1887, p. 3063.
19	6.5	8,580	6.4	.....	1,335	3.00	25,700	F	All gauge readings
20	6.3	8,610	6.5	.....	1,316	2.79	24,060	F	are referred to the
24	7.0	9,425	7.0	.....	1,341	3.08	29,050	F	St. Louis City Di-
25	7.3	10,180	7.6	.....	1,347	3.16	32,240	F	rectrix which is
*March 1	6 8	9,355	7.4	.....	1,271	3.11	29,100	F	433.97 feet above the
5	6.4	8,895	7.0	.....	1,261	2.87	25,520	F	Cairo datum plane.
7	6.5	9,135	7.2	.....	1,267	2.99	27,280	F	
8	6.7	9,235	7.2	.....	1,274	3.07	28,340	F	St. Charles 25 miles above mouth.
12	8.3	11,620	8.8	.....	1,316	3.46	40,220	F	
13	8.2	11,490	8.7	.....	1,313	3.38	38,780	F	* New section about 800 feet above the bridge.
15	9.3	12,540	9.1	.....	1,384	3.77	47,230	F	
17	9.7	13,840	9.8	.....	1,413	3.78	52,320	F	
18	9.7	13,645	9.7	.....	1,413	3.88	52,950	F	F = double floats.
19	10.0	14,510	10.2	.....	1,428	4.20	60,900	F	
20	10.1	14,495	10.0	.....	1,448	4.02	58,240	F	
21	10.1	14,120	9.7	.....	1,452	3.94	55,580	F	
24	9.1	13,015	9.4	.....	1,385	3.60	46,810	F	
25	8.9	12,655	9.2	.....	1,368	3.54	44,780	F	
27	8.4	11,905	9.0	.....	1,316	3.36	39,950	F	
31	7.9	11,350	8.7	.....	1,303	3.10	35,220	F	
April.. 4	12.0	16,470	10 4	.....	1,584	4.54	74,740	F	
5	11.8	17,550	11.2	.....	1,570	4.25	74,680	F	
11	17.9	27,940	14.7	.....	1,900	6.81	190,270	F	
12	18.3	29,280	15.4	.....	1,900	7.00	204,820	F	
15	18.4	27,820	14.8	.....	1,876	6.43	178,870	F	
18	15.9	26,235	15.9	.....	1,646	5.05	132,510	F	
19	15.1	24,785	15.0	.....	1,648	4.78	118,150	F	
22	13.5	20,715	13.5	.....	1,531	4.24	87,920	F	
23	13.1	19,580	12.8	.....	1,526	4.31	84,350	F	
25	12.5	18,615	13.5	.....	1,487	4.08	75,000	F	
26	12.4	18,225	12.3	.....	1,486	4.12	75,140	F	
29	12.0	18,194	12.4	.....	1,472	3.93	71,550	F	
30	11.9	17,740	12.1	.....	1,470	3.97	70,490	F	
May.... 1	11.9	17,030	11.6	.....	1,467	3.89	66,170	F	
2	11.8	17,280	12.1	.....	1,459	3.83	66,220	F	
5	11.6	16,265	11.5	.....	1,412	3.79	61,700	F	
6	11.6	16,145	11.4	.....	1,412	3.85	62,220	F	
7	11.8	16,285	11.1	.....	1,470	3.84	62,580	F	
8	12.5	18,795	12.6	.....	1,495	4.13	77,570	F	
9	12.7	19,325	12.9	.....	1,494	4.12	79,690	F	
13	12.9	18,854	12.3	.....	1,528	4.51	85,110	F	
14	12.8	19,100	12.5	.....	1,527	4.58	87,600	F	
15	12.8	18,990	12.4	.....	1,528	4.20	79,770	F	
16	13.0	19,610	12.5	.....	1,531	4.36	85,580	F	
17	12.9	19,965	13.1	.....	1,528	4.35	86,810	F	
19	12.7	19,255	12.9	.....	1,495	4.39	84,600	F	
20	12.6	16,975	11.4	.....	1,491	4.28	72,650	F	
21	12.6	16,535	11.1	.....	1,492	4.36	72,060	F	
22	12 8	17,124	11.4	.....	1,496	4.38	75,010	F	
23	12.9	17,530	11.5	.....	1,525	4.49	78,820	F	
26	12.6	16,300	10.9	.....	1,495	4.55	74,220	F	
27	12.6	16,550	10.6	.....	1,491	4.40	72,790	F	
28	12.8	17,545	11.7	.....	1,498	4.39	76,960	F	
30	13.3	17,610	11.5	.....	1,533	4.48	78,870	F	
31	13.5	17,925	11.7	.....	1,535	4.65	83,420	F	
June... 2	13.5	18,358	12.0	.....	1,536	4 60	84,380	F	
4	15.2	21,106	12.8	.....	1,652	5.27	111,250	F	
5	15.2	20,806	12.6	.....	1,652	5.22	108,570	F	
6	15.5	21,644	13.1	.....	1,657	5.42	117,320	F	
7	16.0	22,216	13.3	.....	1,665	5.49	121,990	F	
9	16.5	23,215	13.9	.....	1,672	5.51	127,950	F	
10	16.3	22,516	13.5	.....	1,667	5.56	125,110	F	

Missouri River.

[Mouth 196 miles above Cairo.]

St. Charles, Mo.—Continued.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1879.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
June...12	16.8	23,128	13.8	.....	1,670	5 35	123,660	F	F = double floats.
13	16.8	23,750	14.1	.....	1,681	5.39	128,110	F	
14	16.6	24,136	14.4	.....	1,679	5.52	133,250	F	
16	17.6	25,553	14 6	.....	1,753	5 57	142,410	F	
17	17.4	25,124	14 4	.....	1,743	5.44	136,750	F	
18	17.9	26,198	14.8	.....	1,765	5.87	153,770	F	
*23	19.8	30,290	16.9	.....	1,957	6.32	191,520	F	* New section about 1,025 feet above the bridge.
24	20.6	31,714	16 0	.....	1,982	6.67	211,450	F	
25	19.6	29,752	15.2	.....	1,960	6.04	179,640	F	
26	20.0	30,893	15.9	.....	1,948	6.29	194,360	F	
30	23.4	35,460	17.4	.....	2,041	7.90	280,270	F	
July... 1	23.2	39,248	19.2	.....	2,045	7.26	284,890	F	
3	23.6	41,060	20.1	.....	2,043	7.08	290,800	F	
5	22.7	38,385	18.9	.....	2,034	6.70	257,170	F	
7	21.8	36,366	18 2	.....	1,998	6.81	247,550	F	
8	21.7	35,840	18.2	.....	1,971	6.09	218,260	F	
9	21.4	35,930	18.2	.....	1,969	6.20	222,900	F	
10	21.0	36,010	18.3	.....	1,969	6.12	220,400	F	
11	20.8	35,600	18.2	.....	1,955	5.96	212,180	F	
12	20.2	33,900	17 6	.....	1,926	5.54	187,960	F	
14	18.9	30,790	16 2	.....	1,899	5.10	157,160	F	
15	18.7	30,810	16.3	.....	1,892	5.18	159,630	F	
16	18.3	29,970	16 0	.....	1,879	5.09	152,440	F	
18	17.3	26,980	15.2	.....	1,770	4 87	131,300	F	
19	17.1	26,220	14.8	.....	1,770	4.90	128,400	F	
†21	16.8	25,260	14.2	.....	1,785	5.06	127,850	F	† Section about 800 feet above the bridge.
22	16.6	25,980	14.6	.....	1,779	4.85	126,020	F	
24	16.9	26,220	14.7	.....	1,784	4.87	127,810	F	
25	17.4	27,330	15.3	.....	1,788	4.80	131,250	F	
26	18.0	28,370	15.8	.....	1,793	5.03	142,660	F	
28	17.4	26,170	14 6	.....	1,789	5 09	133,300	F	
29	16.7	25,130	14.1	.....	1,782	4 83	121,490	F	
30	16.6	24,790	13.9	.....	1,783	4.64	114,960	F	
31	16.2	23,670	13.3	.....	1,775	4.80	113,720	F	
Aug.... 1	16.1	23,150	13.1	.....	1,768	4.77	110,330	F	
2	15.9	23,470	13.3	.....	1,769	4.59	107,750	F	
4	16.2	23,610	13.3	.....	1,772	4.63	109,330	F	
5	16.1	24,360	13.8	.....	1,771	4.61	112,290	F	
6	16.4	25,430	14.3	.....	1,777	4.88	124,210	F	
7	16.6	25,980	14 6	.....	1,778	5.02	130,310	F	
8	16.1	23,720	13.4	.....	1,772	4.93	116,920	F	
9	15.5	23,560	13.4	.....	1,754	4.60	108,370	F	
11	14.7	20,970	12.4	.....	1,696	4.59	96,350	F	
12	14.2	20,420	12.2	.....	1,667	4.71	96,240	F	
14	13.7	19,610	12.6	.....	1,551	4.33	84,880	F	
16	13.0	18,740	12.3	.....	1,525	4.15	77,740	F	
18	12.4	17,050	11.5	.....	1,486	3.96	67,430	F	
19	12.1	17,410	11.8	.....	1,476	3.95	68,780	F	
20	11.9	17,520	11.9	.....	1,473	3.85	67,430	F	
21	11.7	17,330	11.8	.....	1,467	3.82	68,780	F	
22	11.5	16,740	11.5	.....	1,460	3.67	67,430	F	
23	11.3	17,030	11.7	.....	1,456	3.69	62,920	F	
26	10.7	15,410	10.7	.....	1,437	3.53	54,450	F	
27	10.5	16,150	11.3	.....	1,428	3.48	56,240	F	
18	10.3	16,000	11.2	.....	1,425	3.44	55,070	F	
29	10.2	15,780	11.1	.....	1,422	3.37	53,240	F	
30	10.1	15,560	11.0	.....	1,421	3.32	51,590	F	
Sept.... 2	9.6	14,670	11.0	.....	1,339	3.11	45,600	F	
3	9.4	14,360	10.8	.....	1,335	3.19	45,850	F	
4	9.3	13,950	10 5	.....	1,333	3.14	43,780	F	
5	9.1	13,240	10.0	.....	1,319	3.18	42,150	F	
6	9.0	13,750	10.5	.....	1,315	3.08	42,410	F	
8	8.8	12,670	9.7	.....	1,306	3.10	39,220	F	
9	8.6	12,670	9.8	.....	1,300	3.11	39,360	F	
10	8.5	12,790	9.8	.....	1,299	3.17	40,540	F	

Missouri River.

[Mouth 196 miles above Cairo.]

St. Charles, Mo.—Continued.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1879.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Sept...11	8.7	12,960	10.0	....	1,302	3.21	41,520	F	F = double floats.
12	9.2	12,880	9.7	.....	1,325	3.58	46,070	F	
13	9.0	13 490	10.2	.....	1,316	3.16	42 690	F	
15	8.8	13,320	10.2	.....	1,307	3.22	42,960	F	
16	8.8	13,300	10.2	.....	1,309	3.19	42,430	F	
17	9.0	13,370	10.2	.....	1,314	3.36	44,890	F	
18	8.9	12,580	9.6	.....	1,312	3 18	39,890	F	
19	8.6	12,420	9.6	.....	1,299	3.19	39,670	F	
20	8.3	11,770	9.2	.....	1,281	3.07	36,090	F	
22	7.7	11,160	8.8	.....	1,271	2.99	33,370	F	
23	7.7	10,760	8.5	.....	1,271	3.13	33,680	F	
24	7.6	10,(00	8.3	.....	1,271	3.05	32,840	F	
25	7.5	10,410	8.3	.....	1,248	3.13	32,620	F	
26	7.4	10,280	8.3	.....	1,244	3.23	33,200	F	
27	7.3	9,910	8.0	.....	1,242	3.09	30,590	F	
29	7.1	9,260	7.5	.....	1,239	3.03	28,050	F	
30	7.1	9,570	7.7	.....	1,238	3.16	30,250	F	
Oct.... 2	6.9	9,390	7.6	.....	1,230	3.06	28,690	F	
3	7.1	9,940	8.1	.....	1,232	2.92	29,010	F	
4	7.3	10,300	8.3	.....	1,243	2.92	30,030	F	
6	7.0	10,350	8.4	.....	1,234	2.89	29,920	F	
7	7 1	10,670	8.6	.....	1,236	2.77	29,600	F	
8	7.1	10,730	8.7	.....	1,235	2.84	30,460	F	
9	7.0	10,330	8.4	.....	1,229	2.77	28,580	F	
10	6.9	10,020	8.2	.....	1,225	2.78	27,820	F	
11	6.8	9,910	8.1	.....	1,225	2.86	28,330	F	
13	7.1	10,240	9.3	.....	1,234	2 93	29,980	F	
14	7.2	10,460	9.4	.....	1,252	2.98	31,160	F	
15	7.2	10,560	8.5	.....	1,240	3.09	32,600	F	
16	7.1	10,340	8.4	.....	1,236	2.95	30,490	F	
17	7.0	10,370	8.4	.....	1,232	2.87	29,800	F	
18	6.9	9,960	8.1	.....	1,227	2.81	27,950	F	
20	6.9	9,850	8.0	.....	1,223	2.97	29,240	F	
21	6.9	10,500	8.5	.....	1,231	2.99	31,350	F	
22	7.1	10,300	8.3	.....	1,239	3.06	31,490	F	
23	7.3	10,790	8.7	.....	1,242	3.10	33,400	F	
24	7.5	10,610	8.5	.....	1,247	3.16	33,540	F	
25	7.4	11,120	8.9	.....	1,248	3.07	34,190	F	
27	7.0	9,920	8.1	.....	1,229	3.04	30,110	F	
28	6.8	9,500	7.8	.....	1,223	2.84	27,010	F	

TRIBUTARIES OF MISSOURI RIVER.

KAW RIVER.

[Mouth 387 miles above mouth of Missouri.]

Kansas City, Mo.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1883.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
July...25	318.6	5,946	10.2	.....	585	0.74	4,418	F	F = double floats.
Aug.... 2	317.2	4,016	7.1	.....	566	1.98	7,936	F	
7	316.2	3,186	5.8	.....	546	1.85	5,891	F	Section 8400 ft. above the mouth. Observations under Maj. C.R. Suter. Tabulation, Report C. of E. 1887, p. 3086. The gauge readings are those of the local gauge and are referred to the St. LouisCity directrix.
11	315.6	2,791	5.2	.....	532	1.49	4,165	F	
14	315.5	2,885	5.4	.....	532	1.79	5,164	F	
18	315.6	2,873	5.4	.....	532	1.66	4,758	F	
21	317.5	3,919	6.8	.....	573	3.15	12,345	F	
28	314.8	2,721	5.0	.....	543	2.09	5,682	F	
31	314.0	2,317	4.5	.....	512	2.02	4,670	F	
Sept.... 3	313.5	2,023	5.0	.....	406	2.04	4,119	F	
8	312.5	1,663	4.3	.....	383	1.81	3,012	F	
11	312.1	1,478	4.1	.....	364	1.82	2,686	F	
15	311.8	1,294	3.6	.....	356	1.97	2,546	F	
18	311.6	1,272	3.7	.....	340	1.75	2,231	F	
25	311.2	1,106	3.3	.....	352	1.73	1,914	F	
29	311.2	1,091	3.2	.....	333	1.85	2,021	F	
Oct.... 3	311.3	1,364	4.0	.....	340	2.29	3,118	F	
10	311.9	1,425	4.2	.....	341	1.99	2,831	F	
13	311.6	1,314	4.0	.....	333	1.90	2,496	F	

GASCONADE RIVER.

[Mouth 107 miles above mouth of Missouri.]

1882.									
Nov... 2	1.3	632	.....	.....	.....	.....	.....	F	The sections were just above Round Isl'd. The gauge used was a temporary stake. Tabulation from MS. received from the Mo. River Com. office.
3	1.0	573	.....	.....	.....	2.49	1,425	F	
4	0.9	550	.....	.....	.....	2.19	1,206	F	
5	1.0	573	.....	.....	.....	2.29	1,309	F	
6	1.4	652	.....	.....	.....	3.15	2,060	F	
7	1.8	727	.....	.....	.....	3.58	2,604	F	
8	1.6	695	.....	.....	.....	3.64	2,533	F	
9	2.4	866	.....	.....	.....	4.69	4,066	F	
10	2.0	770	.....	.....	.....	4.37	3,365	F	
*9	2.6	1,675	.....	.....	.....	3.22	5,392	F	* New section.
10	2.2	1,592	.....	.....	.....	2.71	4,074	F	
11	1.8	1,398	.....	.....	.....	2.45	3,431	F	
12	4.5	2,423	.....	.....	.....	3.99	9,649	F	
13	5.7	2,954	.....	.....	.....	4.65	13,739	F	
13	6.0	3,086	.....	.....	.....	4.90	15,140	F	
14	7.0	3,534	.....	.....	.....	4.83	17,061	F	
15	5.0	2,625	.....	.....	.....	3.98	10 443	F	
16	4.4	2,376	.....	.....	.....	3.49	8,302	F	
17	3.7	2,104	.....	.....	.....	3.53	7,435	F	
17	3.5	2,013	.....	.....	.....	3.45	6,940	F	
18	3.1	1,834	.....	.....	.....	3.42	6,283	F	
19	2.6	1,664	.....	.....	.....	3.10	5,153	F	
20	2.3	1,562	.....	.....	.....	2.89	4,513	F	
21	2.1	1,490	.....	.....	.....	2.63	3,945	F	
22	2.0	1,464	.....	.....	.....	2.17	3,184	F	

Ohio River.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1867-9.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
.....	0.0	.....	.....	.....	.....	.....	2	.....	At Pittsburgh, 1021 miles above Cairo.
.....	0 2	.....	.....	.....	.....	.....	3	.....	
.....	0.5	.....	.....	.....	.....	.....	4	.....	
.....	0.8	.....	.....	.....	.....	.....	6	.....	
.....	1 0	.....	.....	.....	.....	.....	7	.....	
.....	2.0	.....	.....	.....	.....	.....	14	.....	
1870.									
.....	8.5	111	.....	.....	.....	3.26	36	F	At Wheeling, W.Va., 926 miles above Cairo. 800 ft. above the bridge.
.....	8.0	157	.....	.....	.....	2.62	41	F	At Parkersburg, 829 miles above Cairo, 900 ft. above bridge.

Mean of 1867-9 observations by Milner Roberts, C. E. At zero of gauge the discharge is tabulated exactly as 1666 cu. ft. Tabulation, Report C. of E. 1881, p. 1929.

Observations of 1870 reported by Board of Engineers. Report C. of E. 1871, pp. 410 and 413.

Paducah, Ky.

[45 miles above Cairo.]

1881.									
Dec.... 28	34.9		.....	.....	.....	.....	.....	.....	M = meter.
29	35.4	1,618	39.7	60.5	4,071	4.56	737	R	F = double floats.
31	35.2		.....	.....	.....	.....	.....	.....	R = rod floats.
1882.									
Jan.... 2	34.5		.....	.....	.....	.....	.....	.....	16 soundings and velocities were taken Dec. 28 and 10 Dec. 29 Dec 31, and Jan. 2, 5 and 18 only velocities were taken. Jan. 6 and 19 and March 1 and 4, both velocities and soundings were taken. Where the maximum soundings are omitted in this table, areas were interpolated. On days not mentioned above when two dates are included in a brace all of the soundings and a part of the velocities were taken the second of the 2 days. Observations and reduction by M.R.C., Secretary's office. Report and tabulation in Report C. of E. 1884, p. 2590. The section was located 2¼ miles below the mouth of Tennessee River. *Velocity probably too low. Meter run at only 9 stations.
3	34.3	1,633	40.4	58.1	4,039	3.72	608	M	
5	34.4		.....	.....	.....	.....	.....	.....	
6	34.2	1,619	40.6	57.8	3,988	3.74	606	M	
7	33.8	1,595	39.8	.....	3,945	3.76	600	M	
9	33.5	1,579	40 4	.....	3,912	3.50	552	M	
10	33.6	.....	.....	57.2	.....	.....	.....	.....	
11	34 4	1,632	40.9	58.4	3,995	3.75	612	M	
13	37.0	1,749	41.7	.....	4,197	4.52	790	M	
14	38.6	.....	.....	62.8	.....	.....	.....	.....	
18	43.6		.....	.....	.....	.....	.....	.....	
19	44 6	2,074	47.4	70.6	4,376	5.22	1,084	M	
20	45.6		.....	.....	.....	.....	.....	.....	
21	46.4	2,142	47.8	.....	4,420	5.76	1,233	M	
28	48.7	2,339	52.7	76.8	4,443	5.21	1,219	R	
30	48.7	2,328	52 4	75.7	4,443	5.15	1,199	R	
Feb.... 2	48.8	2,330	52.4	76.0	4,443	5 12	1,192	R	
3	48.7	2,291	51.6	73.0	4,443	5.26	1,206	R	
10	45.0	2,122	48.1	69.5	4,416	4.76	1,010	R	
13	43.2		.....	.....	.....	.....	.....	.....	
14	43.0	2,012	46.6	68.0	4,320	4.51	908	M	
22	47.6	2,231	48.7	.....	4,584	4.85	1,081	M	
23	48.5	.....	.....	73.1	.....	.....	.....	.....	
24	49.3		.....	.....	.....	.....	.....	.....	
25	49.8	2,358	51.4	74.0	4,586	4.98	1,174	M	
27	49.8		.....	.....	.....	.....	.....	.....	
28	49.6	2,370	51.7	.....	4,587	4.62	*1,095	M	
March. 1	49.3	2,333	50.9	76.0	4,585	4.80	1,119	M	
2	49.0		.....	.....	.....	.....	.....	.....	
3	48.8		.....	.....	.....	.....	.....	.....	
4	48.4	2,315	50.3	73.6	4,583	4.96	1,148	M	
7	46.3		.....	71.1	.....	.....	.....	.....	
8	45.5	2,218	50.0	70.7	4,440	4.65	1,032	M	
10	45.2		.....	.....	.....	.....	.....	.....	
11	45.0	2,180	48.0	70 2	4,440	4.19	892	M	
14	45.4	2,154	48.5	69.3	4,440	4.48	964	M	
15	45.3	2,153	48.5	.....	4,440	4.36	939	M	
16	45.0	.....	.....	69.7	.....	.....	.....	.....	

Ohio River.

Paducah, Ky.—Continued.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	100 sq ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
March 17	44.4	.....	.....	.....	.....	.....	.....	.....	M = meter.
18	43.7	2,114	47 9	69.8	4,415	4.31	911	M	R = rod floats.
20	41.6	1,984	45.7	.....	4,340	4 24	842	M	
23	36 3	1,718	41.5	.....	4,137	5.87	665	M	
25	34.9	1,677	41 4	60.6	4,053	4.08	685	M	
27	35.1	.....	.....	.....	.....	.....	.....	.....	
28	35.5	1,685	41.2	60.8	4,085	4.11	692	M	
29	36.1	1,723	41.6	61.2	4,135	4.08	703	M	
30	36.5	1,738	41.9	61 5	4,149	4.04	702	M	
April.. 1	36.9	1,764	42.3	63.6	4,170	4.15	732	M	
3	35.8	1,689	41.0	60.6	4,120	4.05	684	M	
4	34.3	1,631	40.7	58.3	4,002	3.86	629	M	
5	32.0	1,537	39.8	.....	3,880	3.68	566	M	
7	26.5	1,336	35.5	.....	3,763	3.12	417	M	
8	25.6	1,304	34.6	50.5	3,762	3.32	432	M	
11	26.6	1,340	35.6	49.6	3,763	3.39	454	M	
14	25.1	1,284	34.5	49.3	3,724	3.14	404	M	
15	24.8	1,271	34.1	48.8	3,722	3.05	388	M	
17	24.1	1,244	33.5	48.5	3,719	2.82	351	M	
18	23.4	1,219	32.8	.....	3,718	2.66	325	M	
20	21.7	1,144	31.0	45.9	3,695	2.61	299	M	
22	19.6	1,063	28.8	43.6	3,693	2.50	265	M	
24	17.8	995	26.6	41.4	3,690	2.25	224	M	
25	17.4	981	26.6	.....	3,690	2.22	217	M	
27	18.4	1,011	27.4	42.1	3,690	2.26	228	M	
28	18.9	1,033	28.0	42.7	3,690	2.33	241	M	
May.... 1	19.9	1,076	29.1	44.0	3,696	2.36	255	M	
3	20.2	1,087	29.4	.....	3,696	2.47	269	M	
5	20 3	1,094	29.6	.....	3,696	2.48	271	M	
6	19 9	1,083	29.3	44.0	3,696	2.49	269	M	
8	19.2	1,053	28.5	.....	3,694	2.53	267	M	
10	25.5	1,303	34.6	.....	3,766	3.36	438	M	
11	28.7	1,428	37.9	53.4	3,768	3.65	521	M	
15	33.0	1,590	41.0	.....	3,880	3.70	589	M	
16	32 8	1,579	40.7	56.5	3,880	3.69	582	M	
17	32.9	1,580	40.7	.....	3,880	3.74	591	M	
18	33.2	1,593	40.9	57 0	3,892	3.76	599	M	
20	33.8	1,618	41.2	59.0	3,916	3.81	615	M	
22	34.6	1,635	41.1	58.0	3,976	3.90	639	M	
24	33.8	1,594	40.6	56.8	3,928	3.81	607	M	
25	32.8	1,554	40.0	55.4	3,882	3.68	572	M	
26	31.3	1,487	39.0	53.6	3,815	3.53	525	M	
27	29.4	1,417	37.5	52.4	3,774	3.28	465	M	
30	26.3	1,285	34.5	48.4	3,728	3.08	395	M	
June... 1	28.5	1,376	36.6	50.8	3,764	3.24	446	M	
2	29.3	1,405	37.3	51.2	3,772	3.32	466	M	
5	31.0	1,475	38.7	52.6	3,815	3.46	511	M	
6	31.3	1,483	38.9	53.6	3,814	3 49	518	M	
7	31.4	1,487	39.0	53.1	3,814	3.44 3.49	512 519	M R	
8	31.1	1,481	38.8	52.0	3,815	3.45	510	M	
9	30.7	1,459	38.4	51.8	3,800	3.36	490	M	
10	30.0	1,433	37.9	50.6	3,783	3.19	457	M	
12	27.9	1,349	35.9	49.1	3,758	3.00	405	M	
13	26.1	1,276	34.2	46.0	3,729	2.83 2.90	361 370	M R	
14	24.1	1,206	32.4	45.1	3,719	2.62	316	M	
15	22.8	1,136	30.5	42.6	3,718	2.56	291	M	
17	20.4	1,058	28.5	40.9	3,710	2.42	256	M	
20	25.2	1,253	33.6	46.1	3,730	3 36	422	M	
22	26.1	1,280	34.3	46.7	3,736	3.36 3.29	431 421	M R	
23	26.4	1,291	34.5	46.6	3,736	3.34	431	M	
24	26.5	1,295	34.7	46.8	3,736	3.27	423	M	
26	25.7	1,268	34.0	46.3	3,733	2.97	377	M	
27	25 0	1,241	33.3	45.1	3,724	2.86	355	M	

Ohio River.

Paducah, Ky.—Continued.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
June...28	23.9	1,200	32.2	44.3	3,724	2.77	332	M	M = meter.
						2.57	309	R	R = rod floats,
30	22.0	1,135	30.5	42.2	3,724	2.46	279	M	F = double floats.
July... 1	22.2	1,147	30.8	42.7	3,724	2.53	290	M	
3	22.2	1,135	30.5	42.6	3,724	2.33	264	M	
5	23.5	1,185	31.8	43.9	3,728	2.36	280	M	
6	24.3	1,214	32.5	44.7	3,732	2.37	288	M	
						2.30	279	R	
8	25.2	1,248	33.4	45.7	3,736	2.50	311	M	
10	24 9	1,231	33.0	45.2	3,736	2.31	285	M	
11	24.5	1,211	32 4	44.8	3,736	2 37	287	M	
14	21.7	1,108	29.7	41.3	3,736	2.30	254	M	
15	20.8	1,083	29.1	41.0	3,720	2.37	257	M	
						2.35	254	R	
17	19.5	1,029	27.7	39.5	3,716	2.49	257	M	
19	17.8	956	25.8	36.4	3,700	2.39	228	M	
						2.25	216	R	
20	17.0	930	25.1	37.1	3,700	2.30	214	M	
21	16 3	909	24 6	36.0	3,698	2.30	209	M	
22	15.9	887	24.0	35.5	3,694	2.25	199	M	
24	14.5	836	22 7	34.3	3,686	2.07	173	M	
25	13.4	794	21 5	33.1	3,683	1 97	157	M	
						1.88	149	R	
27	11.1	713	19.5	31.1	3,662	1.88	134	M	
28	10.2	684	18.7	30.1	3,656	1.86	127	M	
29	9.6	659	18.0	29.8	3,654	1.90	125	M	
31	8.7	620	17.0	27.7	3,644	1.88	116	M	
Aug... 1	8.4	609	16.7	28.2	3,643	1.83	112	M	
2	8.2	609	16.7	27.1	3,642	1.89	115	M	
						1.78	108	R	
3	8.1	603	16.5	27.7	3,642	1.90	114	M	
4	8.2	601	16.5	28 0	3,640	1.98	119	M	
5	9.0	626	17.2	27 6	3,643	2.16	135	M	
7	12.1	739	20.1	30.7	3,668	2.55	189	M	
8	12.5	757	20.6	32.2	3,672	2.63	199	M	
9	12.5	759	20.7	32.2	3,672	2.50	190	M	
10	12.4	755	20.6	32.1	3,672	2.51	190	M	
						2.42	182	R	
11	12.4	755	20.6	32 2	3,674	2.54	192	M	
12	12.5	759	20.7	32.2	3,674	2.56	194	M	
14	12.0	738	20.1	31.5	3,670	2.54	187	M	
15	11.6	728	19.8	.....	3,670	2.48	180	M	
16	11.4	723	19.7	31.2	3,668	2.48	179	M	
17	11.3	719	19.6	.....	3,668	2.55	183	M	
						2.50	180	R	
19	11.1	709	19.3	30.8	3,667	2.52	177	M	
21	10.4	689	18 8	30.1	3,660	2.43	168	M	
22	9.8	664	18.2	29.3	3,658	2.33	155	M	
23	9.1	636	17.4	.....	3,652	2.24	143	M	
						2.23	142	R	
24	8.4	615	16.9	27.9	3,646	2 17	133	M	
25	7.9	592	16.3	.....	3,639	2.11	125	M	
26	7.4	577	15.9	26.9	3,632	2.02	116	M	
28	6.8	561	15.7	26.4	3 626	1.95	110	M	
29	6.6	550	15.2	.....	3,624	1.90	104	M	
30	6.7	554	15.3	26.4	3,625	1.95	108	M	
						1.92	106	R	
31	7.0	561	15.5	.....	3,628	2.03	114	M	
Sept.... 1	7.2	568	15.7	26 9	3,630	2 06	117	M	
4	7.9	590	16.2	27.4	3,638	2.12	125	M	
5	8.0	593	16.3	.....	3,640	2.16	128	M	
6	8.4	610	16.7	28.0	3,646	2.23	136	M	
7	8.9	626	17.1	.....	3,648	2.32	145	M	
8	9.2	637	17.5	28.9	3,648	2.35	150	M	
9	9.3	638	17.5	.....	3,648	2.35	150	M	

Ohio River.

Paducah, Ky.—Continued.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Sept. 12	8.1	596	16.4	27.4	3,639	2.16	129	M	M = meter.
13	7.7	586	16.1	.....	3,635	2.18	125	M	R = rod floats.
	.....	.....	.....	.....	.....	2.04	120	R	
14	7.4	575	15.8	26.9	3,632	2.00	115	M	
15	7.1	571	15.7	26.2	3,629	2.01	115	M	
16	7.4	582	16.0	.....	3,633	2.08	121	M	
	.....	.....	.....	.....	.....	2.07	120	R	
18	10.7	697	19.0	.....	3.661	2.62	182	M	
19	11.9	745	20.3	31.6	3,670	2.78	207	M	
20	12.6	769	20.9	.....	3,676	2.87	221	M	
22	11.2	721	19.7	30.3	3,666	2 54	183	M	
23	10.2	680	18.6	.....	3,658	2.39	162	M	
	.....	.....	.....	.....	.....	2.41	163	R	
25	8.7	609	16.7	.....	3,647	2.21	135	M	
26	7.9	595	16.4	26.3	3,634	2.09	125	M	
28	6.5	548	15.1	.....	3,621	1.93	105	M	
	.....	.....	.....	.....	.....	1.90	104	R	
29	6.1	534	14.8	25.3	3,619	1.89	101	M	
30	5.8	524	14.5	.....	3,616	1.85	97	M	
Oct. 2	5.4	507	14.0	24.4	3,613	1.78	91	M	
3	5 7	518	14.3	24.6	3,616	1.83	95	M	
4	6.0	523	14.4	.....	3,619	1 90	99	M	
	.....	.....	.....	.....	.....	1.88	98	R	
5	6.0	526	14.5	25.4	3,62.	1.91	100	M	
6	6.0	525	14.5	.....	3,620	1.92	101	M	
7	6.0	523	14.5	25.2	3,620	1.90	99	M	
9	6.0	527	14.6	25.2	3,620	1.90	100	M	
11	6.0	528	14.6	25.2	3,620	1.89	100	M	
12	5.8	519	14.3	.....	3,619	1.86	97	M	
	.....	.....	.....	.....	.....	1.82	95	R	
14	5.2	499	13 8	24.6	3,616	1.78	89	M	
16	4.6	476	13.2	.....	3,607	1.63	78	M	
18	4.1	455	12.6	23 2	3,600	1.57	71	M	
19	4.0	451	12.5	.....	3,599	1.56	70	M	
20	3.8	443	12.3	23.1	3,598	1.47	65	M	
21	3.6	437	12.1	.....	3,597	1.42	62	M	
23	3.4	428	11.9	.....	3,595	1.41	60	M	
24	3.2	424	11.8	.....	3,594	1.38	58	M	
	.....	.....	.....	.....	.....	1.34	57	R	
25	3.2	421	11.2	22.5	3,594	1.38	58	M	
26	3.1	421	11.1	22.4	3,594	1.34	56	M	
27	3.2	422	11.7	.....	3,595	1.37	58	M	
28	3.4	429	11.9	.....	3,596	1 43	61	M	
30	3.4	432	12.0	.....	3,597	1.45	63	M	
31	3.3	428	11.9	22.7	3,599	1.40	60	M	
Nov. 1	3.2	423	11.8	.....	3,597	1.37	58	M	
	.....	.....	.....	.....	.....	1.35	57	R	
2	3.2	418	11.6	22.3	3,595	1.34	56	M	
3	3 1	415	11.6	.....	3,594	1.30	54	M	
4	3.0	412	11.5	22.3	3,593	1.32	55	M	
6	3.0	413	11.5	.....	3,593	1.38	57	M	
7	3.2	418	11.6	22.3	3,594	1.36	57	M	
8	3.3	424	11.8	.....	3,596	1.44	61	M	
9	3.5	432	12.0	.....	3,598	1.45	63	M	
10	4.1	451	12.5	.....	3,604	1.53	69	M	
11	4.4	463	12.8	23.9	3,608	1.66	77	M	
14	4.9	481	13.3	.....	3,613	1.72	83	M	
15	4.8	474	13.1	23.9	3,615	1.71	81	M	
16	4.7	476	13.2	.....	3,616	1.67	80	M	
	.....	.....	.....	.....	.....	1.70	81	R	
20	5.0	489	13.5	.....	3,620	1.76	86	M	
21	4 9	484	13.4	23.5	3 618	1 77	86	M	
22	4.7	478	13.2	.....	3,615	1.68	80	M	
24	4.6	472	13.1	23.3	3,601	1.66	78	M	
25	4.5	468	13.0	.....	3,600	1.65	77	M	

Ohio River.

Cairo, Ills.

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1857.	feet.	100 sq. ft.	feet.	feet.	feet.	feet.	1000 cu. ft.		
Dec.... 3	12.8	653	.....	.....	.....	2.87	183	F	M = meter.
7	15.8	722	.....	.....	.....	3.35	242	F	R = rod floats.
1891.									F = double floats.
Nov....11	2.9	584	27.5	36.8	2,122	0.72	42	F	

Water surface of 1857 referred to the zero of present gauge which is 290.84 feet above Cairo datum plane. Tabulation, Humphreys and Abbot's Report, p. 608.

Observations of 1891 under M. R. C. 1st District officer. Reduction in Secretary's office. Tabulation, Report C. of E. 1892, p. 3127. Cairo is at mouth of Ohio River.

TRIBUTARIES OF OHIO RIVER.

Great Kanawha River.

[Mouth 750 miles above Cairo.]

Vicinity of Charleston, about 50 miles above the mouth.

		sq. ft.					cu. ft.		
1838.	Extreme L. W.	.....	.....	.....	.....	.....	1,100	.....	Below Buffalo.
1856.	Ordinary L. W.	.....	.....	.....	*590	.....	1,350	.....	*Approximate.
1858.		.....	.....	.....	.....	.....	1,297	.....	
1875.	Charles'n gauge.								
.....	3.0	4,182	.....	.....	.....	.....	2,492	R	
.....	3.9	4,877	.....	.....	.....	.....	4,925	R	
.....	5.3	5,903	.....	.....	.....	.....	8,613	R	
.....	6.8	7,370	.....	.....	.....	.....	12,733	R	
.....	8.1	8,507	.....	.....	.....	.....	18,562	R	
.....	9.2	9,939	.....	.....	.....	.....	28,798	R	
.....	14.4	13,169	.....	.....	.....	.....	47,120	R	
.....	19.6	17,710	.....	.....	.....	.....	76,851	F	
.....	32.6	25,365	.....	.....	.....	.....	118,291	F	
1878.									
Jan....16	34.6	.... ..	.....	.....	.....	.....	155,388	.....	
1881.									
Sept... 15	—0.1	488	.....	.....	.....	.....	1,130	F	
			.....	.....	.....	.....	1,184	S. F.	S. F. = surface floats.

Observations of 1838 by Mr. Gill.

Observations of 1856 by Mr. J. A. Byers. Report C. of E. 1877, p. 807, and 1873, p. 839.

Observations of 1858 by Mr. Ellet below Lykins Shoal and Elk River.

Observations of 1875 under direction of Col. W. P. Craighill in Charleston Pool, 2 miles below the foot of Catfish Shoal.

Tabulation of results of observations of 1838, 1858 and 1875 in Report C. of E. 1876, Part II, p. 160.

The Charleston gauge established in 1873 reads zero at about 1 foot below ordinary L. W.

The observations of 1875 were republished in Report C. of E. 1892, p. 2053, and are there referred to the standard gauge, same as herein.

Observations of 1878 above the Elk, under Capt. C. B. Phillips. Report C. of E. 1878, p. 473. See also Elk River.

Observations of 1881 under the direction of Col. W. P. Craighill at Elk Shoal. Report C. of E. 1883, p. 715.

Elk River.

[50 miles above mouth of Great Kanawha.]

1878.	Charles'n gauge.									
Jan....16	35.4	.....	.....	.....	.....	.....	.....	32,959	....	At mouth.

See note to Kanawha River discharge of the same date.

KENTUCKY RIVER.

[Mouth 463 miles above Cairo.]

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1867-9.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
.....	L. W.	.....	.....	.....	.....	.....	20,000	.....	At Beattyville.

Tabulated by Maj. W. E. Merrill in Report C. of E. 1879, p. 1417. "There is no appreciable increase in the discharge between Beattyville and the mouth of the river."

TENNESSEE RIVER.

[Mouth 45 miles above Cairo.]

1891.									Above Knoxville,
May....28	*2.5	.....	.....	.....	.....	.....	11,150	.....	which is 670 miles
Oct.....17	*0.8	.....	.....	.....	.....	.....	3,950	.....	above the mouth.
Aug.... 1	*5.0	.....	.....	.....	.....	.....	25,350	.....	Below Loudon, which
Oct.....23	*0.9	.....	.....	.....	.....	.....	6,850	.....	is 608 miles above the mouth.
Nov....13	3.0	.....	.....	.....	.....	.....	17,550	.....	Chattanooga, which is
1892.									437 miles above mo.
April..11	30.0	.....	.....	.....	.....	.....	222,650	.....	
Dec....12	2.3	.....	.....	.....	.....	.....	13,700	.....	At Soddy Shoals, 510 miles above mouth.

* The Chattanooga gauge, whose zero is 630.64 feet above sea level, read as follows: May 28, 4.1; Oct. 17, 1.6; Aug. 1, 8.3; Oct. 23, 1.5.

Observations by Capt. Biddle. Tabulation 1891-92. Report C. of E. 1893, p. 2366.

CLINCH RIVER.

[Mouth about 591 miles above mouth of the Tennessee.]

1891.	Above L. W.								
Oct....25	0.6	.....	.....	.....	.....	.....	800	.....	1 mile above mouth.

HIWASSEE RIVER.

[Mouth 524 miles above mouth of the Tennessee.]

1891.									
Oct....29	approx 0.8	.....	.....	.....	.....	.....	1,650	.....	1 mile above mouth.

Tabulation for Clinch and Hiwassee rivers in Report C. of E. 1893, p. 2366.

TRIBUTARIES OF MISSISSIPPI RIVER.

HATCHEE RIVER.

[Mouth 180 miles below Cairo.]

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1858.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
March. 3	Below H W 19.5	2,933	.....	.....	.....	2.25	6,590	F	Aboveforks at mouth.

Tabulation, Humphreys and Abbot's Report, p. 603.

ST. FRANCIS RIVER.

[Mouth 298 miles below Cairo.]

1858.	Below H.W.'58								F = double floats. R = rod floats.
Feb....27	26 1	17,800	.....	.....	.. ..	1.15	20,523	F	½ mile above mouth.
April..27	8.0	30,727	.. ...	.....	.....	0.74	22,576	F	
1883.	Below H.W.'82								
March. 8	1.0	47,829	57.3	.....	835	7.8	373,000	R	At Smiley Plantation, about 2½ miles above mouth of river.
1884.									
March. 4	*38.80	26,254	.....	.....	.....	5.17	135,651	L	L = ship's log. Section at Westbrook, Ark.

Tabulation, 1858, Humphreys and Abbot's Report, p. 603.

Observations and reduction, 1883 and 1884, by M. R. C. Secretary's office. Tabulation, Report C. of E. 1885, pp. 2626 and 2650 respectively.

*The gauge reading given is that of the Mhoon Landing gauge, whose zero is 181.48 feet above the Cairo datum plane.

ST. FRANCIS BASIN.

1890. March 17,18,19	35.60	264,994	.....	.....	... ...	1.84	487,536	M	Across K. C., S. & M. Ry.
Mch 28,29	35.50	274,020	.....	.....	.....	1.77	484,111	M	
Mch 21,22	35.40	498,250	.....	.....	.....	1.16	578,817	M	Across St. L., I. M. & S. Ry.
April.1,3	35.40	229,551	.....	.....	.....	2.18	501,225	M	Across L. R. & M. Ry

Observations and reduction by M. R. C. 1st District officer. Tabulation Report C. of E. 1890, p. 3217 and 1891, p. 3546.

The gauge readings tabulated for St. Francis Basin are those observed on the U. S. Engineer gauge at Memphis, whose zero is 203.97 feet above the Cairo datum plane.

WHITE RIVER.

[Mouth 393 miles below Cairo.]

1858.	Below H.W.'58								
Jan.... 1	9.4	22,976	....	.....	.....	2.08	47,767	F	Just below Arkansas Cut-off.
1871.	Extreme L. W.	.....	.....	.....	.....	.....	284	....	Report C. of E. 1872, p. 377.
1882. March.28	*46.2	. .....	42.5	... .	750	.....	117,500	R	½ mile below Cut-off.

Tabulation, 1858, Humphreys and Abbot's Report, p. 603.

Observation 1882, by Secretary M. R. C. Report C. of E. 1885, p. 2610.

* U. S. Engineer gauge, Mouth of White River, whose zero is 128.73 feet above the Cairo datum plane. "On March 27 [1882] Montgomery Pass or Cut-off was examined. No perceptible current was found. The mean depth was 29 feet".

White River.

[Mouth 393 miles below Cairo.]

Clarendon, Ark.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1879.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Feb.... 5	22.0	13,671	.....	.....	.....	2.49	34,025	F	184 miles above the mouth.
6	22.3	13,832	.....	.....	.....	2.47	34,113	F	
7	22.6	13,965	.....	.....	.....	2.66	37,208	F	
8	22.8	14,072	.....	.....	.....	2.70	37,996	F	F = double floats.
11	23.3	14,359	.....	.....	.....	2 75	39,405	F	
12	23.3	14,339	.....	.....	.....	2.74	39,263	F	Observations for 1879 taken under Maj. W. H. H. Benyaurd. The gauge tabulated is at the same elevation as the M. R. C. gauge. The section was about one mile below Clarendon. The table does not include discharge of Rockrow Bayou, which was only 381 cu. ft. per second at its maximum, May 9; nor does it include the overflow on bottom land west of the ordinary channel, which commenced at a stage of 17.9 ft. with a discharge of 35 cu. ft. and had a maximum Feb. 11 with a discharge of 347 cu. ft. Tabulation, Report C. of E. 1894, p. 2855.
15	23.2	14,285	.....	.....	.....	2.62	37,394	F	
18	22.7	14,045	.....	.....	.....	2.56	35,925	F	
19	22.4	13,885	.....	.....	.....	2.41	33,447	F	
20	22.1	13,698	.....	.....	.....	2.36	32,372	F	
27	18.6	11,684	.....	.....	.....	1.86	21,726	F	
March. 3	16.6	10,627	.....	.....	.....	1.76	18,741	F	
4	16.1	10,364	.....	.....	.....	1.69	17,503	F	
5	15 6	10,101	.....	.....	.....	1.69	17,075	F	
12	12.9	8,461	.....	.....	.....	1.66	14,039	F	
15	12.8	8,409	.....	.....	.....	1.66	13,934	F	
19	13.8	8,931	.....	.....	.....	1.82	16,215	F	
21	14.3	9,219	.....	.....	.....	1.87	17,201	F	
24	15.8	9,940	.....	.....	.....	1.91	18,982	F	
25	15.9	9,992	.....	.....	.....	1.87	18,664	F	
27	16.0	10,019	.....	.....	.....	1.86	18,629	F	
29	15.5	9,755	.....	.....	.....	1.78	17,377	F	
31	14.7	9,361	.....	.....	.....	1.59	14,865	F	
April.. 2	14.4	9,177	.....	.....	.....	1.67	15,382	F	
5	14.6	9,308	.....	.....	.....	1.66	15,403	F	
8	15.4	10,164	.....	.....	.....	1.58	16,105	F	
12	16.8	10,900	.....	.....	.....	1.88	20,439	F	
15	16.9	10,978	.....	.....	.....	1.82	20,002	F	
16	16.8	10,899	.....	.....	.....	1.85	20,203	F	
18	16.2	10,583	.....	.....	.....	1.72	18,196	F	
26	15.4	9,997	.....	.....	.....	1.62	16,148	F	
28	16.0	10,339	.....	.....	.....	1.78	18,385	F	
29	16.1	10,392	.....	.....	.....	1.77	18,398	F	
30	16.1	10,392	.....	.....	.....	1.76	18,340	F	
May... 1	16.3	10,497	.....	.....	.....	1.92	20,163	F	
2	16.8	10,734	.....	.....	.....	1.93	20,683	F	
5	18.3	11,525	.....	.....	.....	2.09	24,051	F	
6	18.7	11,762	.....	.....	.....	2.12	24,880	F	
7	19 0	11,894	.....	.....	.....	2.19	26,072	F	
8	19.2	12,001	.....	.....	.....	2.20	26,359	F	
9	19.3	12,032	.....	.....	.....	2.16	26,055	F	
10	19.3	12,078	.....	.....	.....	2.12	25,634	F	
13	18.5	11,643	.....	.....	.....	2.00	23,295	F	
14	17.9	11,326	.....	.....	.....	1.99	22,570	F	
15	17.2	10,932	.....	.....	.....	1.88	20,543	F	
16	16 3	10,484	.....	.....	.....	1.82	19,085	F	
17	15.5	10,036	.....	.....	.....	1.78	17,881	F	
19	13.8	9,170	.....	.....	.....	1.63	14,920	F	
22	12.7	8,454	.....	.....	.....	1.64	13,823	F	
23	12.6	8,377	.....	.....	.....	1 63	13,657	F	
26	11.8	7,968	.....	.....	.....	1.55	12,346	F	
27	11.4	7,767	.....	.....	.....	1.49	11,596	F	
28	10.9	7,506	.....	.....	.....	1.47	11,019	F	
29	10.4	7,277	.....	.....	.....	1.42	10,373	F	
June... 3	8.7	6,421	.....	.....	.....	1.32	8,500	F	
6	8.3	6,209	.....	.....	.....	1.22	7,565	F	
7	8 3	6,185	.....	.....	.....	1.31	8,082	F	
9	8.7	6,408	.....	.....	.....	1.35	8,664	F	
10	8.8	6,434	.....	.....	.....	1.34	8,609	F	
12	8.6	6,358	.....	.....	.....	1.29	8,208	F	
13	8.4	6,259	.....	.....	.....	1.28	8,036	F	
16	7.7	5,913	.....	.....	.....	1 21	7,167	F	
18	7.2	5,644	.....	.....	.....	1.22	6,879	F	
19	7.0	5,571	.....	.....	.....	1.19	6,635	F	
20	6.8	5,474	.....	.....	.....	1.09	5,962	F	

White River.

[Mouth 893 miles below Cairo.]

Clarendon, Ark.—Continued.

DATE	Gauge Reading.	Area of Cross Sec'n, sq. ft.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	DISCHARGE PER SECOND CUBIC FEET. River.	Bank.	Total.	Method.	REMARKS.
1892.	feet.		feet.	feet.	feet.	feet.					
May....19	28.5	18,062	28 0	44 0	646	2.79	50,425	54.987	105,412	M	
20	28.9	18.500	28.6	42.0	646	2 96	54,792	*56,290	111,082	M	
21	29 3	18 614	28.7	42 5	648	3 81	61,531	57,593	119,124	M	
23	30.4	19,439	26.7	43 0	728	3.39	65,935	75,758	141,693	M	
24	31.1	19,962	27.4	44.0	728	3.55	70,946	84,073	155,019	M	
25	31.8	20,675	28 3	44 0	730	3.92	80,921	90,141	171,062	M	
26	32.3	20,898	28.6	45.0	730	3.90	81,471	90,886	172,357	M	
27	32.6	21,118	28 9	45 5	730	3.73	78,881	90,946	169,777	M	
28	32.7	21,288	29.2	45 0	730	3.80	80,879	92,024	172,903	M	

M = meter. F = double floats.

* Interpolated between 19th and 21st.

Area of bank discharge May 19 was 67,270 sq. ft, and width was 15,774 feet. The area increased to 131,065 sq. ft. on May 28, the width remaining about the same. The observations were made along the St. L. & S. W. Ry., formerly the St. L., Ark. & Texas Ry. The section was at the bridge. The M. R. C. gauge readings are tabulated. Observations 1892 and 1893 under M. R. C., 2nd District officer; reduction in Secretary's office. Tabulations, Report C. of E. 1894, pp. 2858, 2840 respectively.

1893.											
May.... 5	29.8	16,282	29.0	36.5	565	3.73	61,103	70,299	131,402	M	
6	30.7	17.093	30.3	37.5	565	3.66	62.544	81,725	144,267	M	
8	32 7	18,135	32.0	39.5	567	3 91	70,898	109,494	180,392	M	
9	33 4	18,526	32 7	40.0	567	4.09	75,813	114,651	190,464	M	
10	33.8	19.420	34.1	42.5	569	4 23	82,062	119,808	201,870	M	

The river discharge section was about 1,100 feet above the bridge at Clarendon; the section used for the bank discharge was at the bridge along the trestle work, for about 15,300 feet of water width, to high ground.

The bank discharge was measured May 6th, 8th and 10th; that given for 5th deduced from 6th by correcting for change of stage; that given for the 9th is the mean of the 8th and 10th.

The bank discharge area observed May 6 was 98,499 sq. ft.; this corrected for change of stage was used for other days, giving for May 10th 141,866 sq. ft.

Arkansas River.

[Mouth 402 miles below Cairo.]

Little Rock, Ark.

1885.											
.....	20.6	26,725	.....	.....	.....	4.12	110 413	.....	.....	F	
1886.											
Dec ... 6	4.7	.....	.....	.....	.....	.....	4,365	.....	.....	...	.
*1887.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	

Observations for 1885 under Capt. H. S. Taber. Report C. of E. 1885, p. 1609.

For 1886 see Report C. of E. 1888, p. 1898.

All gauge readings tabulated here are those of the U. S. Engineer gauge whose zero is 241.55 feet above the Cairo datum plane. Little Rock is 176 miles from mouth.

1892.											
May....23	30.0	37,710	25.4	.....	1,487	12.11	456,565	.....	.....	F	
24	29.4	36,962	24.9	.....	1,484	11.12	410,829	.....	.....	F	

Areas, 1892, are based on soundings made by Capt. Taber in January, 1892. The mean of four cross-sections within limits of distance traveled by the floats is taken for discharge section Tabulation, Report C. of E. 1893, p. 3694. Report on work ibid. pp. 3673, 3681. Observations 1892 and 1893 under M. R. C. 2nd District officer; reduction in Secretary's office.

1893.											
May.... 6	25.2	42,766	22.9	29.0	1,866	4.60	196,907	.....	.....	S. F.	
7	23.8	40,325	21.6	28.0	1,862	4.52	182,413	.....	.....	S. F.	S F =
8	22.5	39,470	21.2	25.5	1,862	4.01	158,297	.....	.....	S. F.	surface
9	22.2	37,504	20.1	25.5	1,862	3.78	141,821	.....	.....	S. F.	floats.
10	22.5	37 338	20.1	24.0	1,862	3.99	148.817	.....	.....	S. F.	

Discharge section of 1893 was 7710 feet below L. R. & Ft. S. R. R. bridge, and about 2900 feet below the lower range of 1892. Tabulation for 1893, Report C. of E. 1894, p. 2840.

Overflow discharge between Arkansas City and Trippe, Ark., May 28-31, was published in Report C. of E. 1893, p. 3701.

* January 24 an observation was taken at Fort Smith, Ark., showing a discharge of 2,972 cu. ft. Report C. of E. 1888, p. 1390. Fort Smith is 255 miles above Little Rock, and allowing an interval of 8¼ days the gauge at Little Rock read 5.4 feet.

ARKANSAS RIVER.

[Mouth 402 miles below Cairo.]

Pine Bluff, Ark.

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1879.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Feb....20	12.6	7,693	7 8	.....	980	3 50	26,949	F	F = double floats.
21	12.3	7,670	8.0	.....	975	3.15	24,167	F	
22	12.0	7,920	8.5	.....	975	2 92	23,101	F	Observations made under direction of Lieut Col. C. R. Suter.
24	11.2	7,861	8 2	.....	975	2 50	19,645	F	
25	10.6	7,555	9 2	.....	975	2.37	17,898	F	
26	10.4	7,430	9.2	.....	975	2.42	17,979	F	
27	10 1	7,335	9.4	.....	975	2.35	17,261	F	Tabulation, Report C. of E. 1894, p. 2852.
28	10.0	7,120	9 3	.....	975	2.28	16,282	F	
March. 1	10.0	7,217	9.4	.....	975	2.28	16,450	F	
3	9.9	7,310	9.6	.....	975	2.24	16,392	F	Pine Bluff 110 miles above mouth.
4	9.8	7,235	9.4	.....	990	2.25	16,245	F	
5	9.6	6,955	9.2	.....	1,005	2.12	14,772	F	The gauge readings tabulated are those of a local gauge whose relation to present gauge is not known.
6	9.4	6,600	9.7	.....	1,008	2.19	14,470	F	
7	9.2	6,490	9.2	.....	998	2.08	13,500	F	
8	9.0	6,355	9 3	.....	1,002	2.14	13,578	F	
10	8.6	6,190	9 4	.....	1,010	2.04	12,649	F	
11	8.6	6,030	9 3	.....	1,000	1.88	11 349	F	
12	8.6	5,910	9.4	.....	1,000	1.91	11,362	F	
13	8.9	6,260	9.2	.....	1,015	2.09	13,079	F	
14	9.3	7,010	9.6	.....	1,005	2.16	15,136	F	The "mean depths" in table are datum depths and are referred to a 12 foot stage on this gauge.
15	9.6	6,970	9 3	.....	1,000	2.16	15,020	F	
17	9.7	7,070	9.3	.....	1,005	2.22	15,676	F	
18	9.4	7,140	9 5	.....	1,005	2.18	15,545	F	
19	9.6	7,140	9.4	.....	1,005	2.29	16,333	F	
20	9.9	7,395	9.4	.....	1,005	2 28	16,841	F	
21	9.8	7,350	9.6	.....	990	2 25	16,578	F	
22	9.6	7,090	9.4	.....	1,000	2.16	15,291	F	
24	9.3	6,790	9.3	.....	1,008	2.19	14,880	F	
25	9.6	6,990	9.4	.....	1,002	2.19	15,318	F	
26	9.6	6,980	9 2	.....	1,000	2 24	15,674	F	
27	9.3	6,850	9 4	.....	1,000	2 18	14,910	F	
28	9.0	6,440	9.4	.....	1,000	2 06	13,260	F	
29	8.7	6,154	9.3	.....	1,010	2.00	12,292	F	
31	8.2	5,740	9.3	.....	1,010	1.79	10,284	F	
April.. 1	8.1	5,685	9.3	.....	1,015	1.78	10,141	F	
2	7.9	5,450	9.3	.....	1,015	1.85	10,036	F	
3	8.1	5,785	9.5	.....	1,010	1.79	10,348	F	
4	8.4	5,966	9 4	.....	1,010	1.92	11,502	F	
5	8.6	6,165	9 3	.....	1,010	2.00	12,323	F	
7	8.3	5,820	9 3	.....	1,010	1.96	11,422	F	
8	8 1	5,590	9.4	.....	1,000	1.81	10,118	F	
9	8.3	5,705	9.5	.....	1,010	1.86	10,589	F	
10	9.1	6,330	9.2	.....	1,000	2.34	14,823	F	
11	9.5	6,900	9.3	.....	1,000	2 17	14,951	F	
12	9.8	7,080	9.3	.....	1,000	2.18	15,435	F	
14	9.1	6,685	9.4	.....	1,010	2.12	14,199	F	
15	8.5	6,250	9.6	.....	1,010	1.91	11,944	F	
16	8.2	5,840	9.4	.....	1,008	1.91	11,144	F	
17	7 9	5,780	9.6	.....	1,010	1.81	10,446	F	
18	8.0	5,660	9.5	.....	1,000	1.87	10,564	F	
19	8.2	5,825	9.4	.....	1,008	1.98	11,543	F	
21	7.7	5,390	9.4	.....	1,008	1 75	9,431	F	
22	7.6	5,270	9.5	.....	1.005	1 73	9,130	F	
23	7.4	5,185	9.5	.....	1,008	1.58	8,212	F	
24	7.3	5,080	9 6	.....	1,010	1.72	8,760	F	
26	7.6	5,255	9.6	.....	1,008	1.76	9,240	F	
28	7 8	5,395	9.4	.....	1,010	1.77	9,524	F	
29	8.3	5,855	9 4	.....	1,010	2 01	11,756	F	
30	11.6	8,360	9.3	.....	995	2 72	22,797	F	
May... 1	15.2	13,125	9.6	.....	990	3.45	45,268	F	
2	15.7	13,965	9 9	.....	990	3.46	48,358	F	
3	15.6	13,780	9.8	.....	998	3.43	47,265	F	
5	14.5	12,595	9 4	.....	1,070	3.20	40,296	F	
6	14.5	12,770	9.3	.....	1,080	3.11	39,756	F	
7	15.5	13,815	9.7	.....	1,030	3.42	47,262	F	

ARKANSAS RIVER.

[Mouth 402 miles below Cairo.]

Pine Bluff, Ark.—Continued.

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1858	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
May... 9	17.4	16,575	9.9	.....	1,040	3.85	63,754	F	F = double floats.
12	15 9	14,085	9 0	.....	1,045	3.32	46,707	F	
15	12.3	10,130	9.6	.....	1,020	2.54	25,738	F	
17	10 8	8,860	9.6	.....	1,030	2.25	19,950	F	
20	9.2	7,105	9.5	.....	1,062	1.99	14,116	F	
23	8.4	6,500	9 6	.....	1,060	1.81	11,771	F	
24	8 2	6,375	9 7	.....	1,050	1.77	11,271	F	
26	7.6	5,860	9.7	.....	1,050	1.75	10,227	F	
27	7.4	5,565	9.7	.....	1,040	1.64	9,103	F	
28	7.2	5,295	9.6	.....	1,040	1.62	8,555	F	
29	7.0	5,350	9 9	.....	1.040	1.56	8,338	F	
30	6.8	4,985	9.7	.....	1,040	1.52	7,595	F	
31	6.7	4,870	9.6	.....	1,040	1.46	7,133	F	
June... 2	6.6	4 940	9 8	.....	1,040	1.43	7,059	F	
3	6.5	4,630	9.6	.....	1,040	1 40	6,467	F	
4	6.4	4,680	9 7	.....	1,040	1.40	6,550	F	
5	6.5	4,445	9 2	.....	1,040	1.47	6 528	F	
6	7.0	4,800	9.5	.....	1,040	1.50	7,222	F	
7	8.8	6,700	8.8	.....	1,040	1.92	12,875	F	
9	8.9	6,900	9.6	.....	1,040	2.01	13,886	F	
10	8.2	6 150	9.6	.....	1,040	1.86	11,435	F	
11	7.6	5,460	9.3	.....	1,040	1.74	9,488	F	
12	7.1	5,100	9.4	.....	1.040	1.60	8,140	F	
13	6.7	4,714	9.4	.....	1,040	1.48	6,981	F	
14	6.4	4,350	9.4	.....	1.040	1.42	6,191	F	
16	6.0	4,290	9.4	.....	1,040	1.29	5,522	F	
17	5.9	4,125	9.3	.....	1,040	1.15	4,746	F	
18	5.8	3,970	9.3	.....	1,040	1.13	4,477	F	
19	5.6	3,780	9.2	.....	1,040	1.05	3,974	F	
20	5.5	3,590	9 1	.....	1,040	1.11	3,971	F	
21	5 4	3,495	9.2	.....	1,040	1.11	3,882	F	
23	5.3	3,510	9.3	.....	1,040	1.15	4,038	F	
24	5.3	3,510	9.2	.....	1,040	1.15	4,035	F	
25	5.3	3,560	9.2	.....	1,040	1.07	3,822	F	
26	5.4	3,555	9.2	.....	1,040	1.16	4,115	F	
27	5.6	3,695	9.2	.....	1,040	1.22	4,500	F	
28	5.6	3,670	9.2	.....	1,040	1.21	4,432	F	
30	6.0	4,010	9.2	.....	1,040	1.20	4,819	F	
July... 1	6.5	4,290	9 0	.....	1,040	1.48	6,363	F	
2	6.8	4,835	9.5	.....	1,040	1.56	7,561	F	
3	6.8	5,010	9.7	.....	1,040	1.51	7,551	F	
4	6.7	4.740	9 5	.....	1,040	1.55	7,347	F	
5	6.7	4,900	9.7	.....	1,040	1.53	7,513	F	

Napoleon, Ark.

1857. Dec... 29	38.0	.....	.....	.....	.....	2.53	65,193	F	Near the mouth.
1858. Jan.... 1	36.0	.....	.....	.....	.....	2.43	58,687	F	
6	31.9	.....	.....	.....	.....	2.14	45,221	F	
15	34.8	.....	.....	.....	.....	2.43	56,917	F	
16	35.3	.....	.....	.....	.....	2.45	57,342	F	
17	35.0	.....	.....	.....	.....	2 54	59,478	F	
18	34.8	.....	.....	.....	.....	2.40	56,079	F	
19	34 4	.....	.....	.....	.....	2.42	54,688	F	
20	32.9	.....	.....	.....	.....	2.33	52,771	F	
21	33.7	.....	.....	.....	.....	2 27	51,421	F	
22	33.5	.....	.....	.....	.....	2.30	50,208	F	

Observations by party of Mr. A. A. Eddington. Dec. 29, 9 floats were observed; Jan. 1, 29; Jan. 6 to Aug. 20, 10; Aug. 21 and 22, 8; Aug. 29 to Nov. 30, 5 each day. Tabulation, Humphreys and Abbot's Report, p. 601. The gauge readings are those of the H. and A. Delta Survey gauge at Napoleon. No connection with the present U. S. Engineer gauge at mouth of White River.

ARKANSAS RIVER.

[Mouth 402 miles below Cairo.]

Napoleon, Ark.—Continued.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1858.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Jan....25	32.6	.....	.....	.....	.....	2.27	49,571	F	F = double floats.
26	33.1	.....	.....	.....	.....	2.36	51,627	F	
27	33.5	.....	.....	.....	.....	2.30	51,932	F	
Feb....25	27.2	.....	.....	.....	.....	2.35	42,139	F	
26	26.8	.....	.....	.....	.....	2.35	41,340	F	
March. 6	25.4	.....	.....	.....	.....	2.39	38,898	F	
9	27.8	.....	.....	.....	.....	2.63	48,030	F	
10	28.3	.....	.....	.....	.....	2.87	54,537	F	
14	30 6	.....	.....	.....	.....	2.85	58,199	F	
18	31.0	.....	.....	.....	.....	2.87	58,515	F	
21	33.5	.....	.....	.....	.....	2.76	62,328	F	
24	37.2	.....	.....	.....	.....	2.99	74,505	F	
26	39.8	.....	.....	.....	.....	2.82	77,937	F	
28	41.4	.....	.....	.....	.....	2.90	82,736	F	
31	44.0	.....	.....	.....	.....	2.86	90,305	F	
April.. 2	45.0	.....	.....	.....	.....	2.79	90,948	F	
3	45.1	.....	.....	.....	.....	3.07	99,835	F	
4	45.2	.....	.....	.....	.....	3.15	102,680	F	
5	45.3	.....	.....	.....	.....	3.23	105,240	F	
6	45.4	.....	.....	.....	.....	3 08	100,180	F	
7	45.4	.....	.....	.....	.....	3.16	102,850	F	
8	45.1	.....	.....	.....	.....	3.14	102,420	F	
15	40.2	.....	.....	.....	.....	2.57	71,074	F	
16	39.9	.....	.....	.....	.....	2.44	67,249	F	
17	39.5	.....	.....	.....	.....	2.36	65,259	F	
26	42.1	.....	.....	.....	.....	2.84	84,066	F	
27	42.4	.....	.....	.....	.....	3.43	101,440	F	
May.... 1	43.4	.....	.....	.....	.....	3.76	114,780	F	
2	43.7	.....	.....	.....	.....	3 66	115,380	F	
6	44.1	.....	.....	.....	.....	3.71	117,650	F	
7	44.1	.....	.....	.....	.....	3.77	118,970	F	
8	44.1	.....	.....	.....	.....	3.76	118,470	F	
9	44 1	.....	.....	.....	.....	3.78	119,390	F	
10	44.1	.....	.....	.....	.....	3.81	120,060	F	
11	44.1	.....	.....	.....	.....	3.66	115,380	F	
12	43.9	.....	.....	.....	.....	3 69	120,080	F	
13	43.8	.....	.....	.....	.....	3.56	112,320	F	
16	43.9	.....	.....	.....	.....	3.79	119,480	F	
17	43.9	.....	.....	.....	.....	3.82	120,420	F	
19	44.2	.....	.....	.....	.....	3.87	122,210	F	
23	44.2	.....	.....	.....	.....	3.94	124,320	F	
27	44.2	.....	.....	.....	.....	3.97	125,130	F	
29	44.2	.....	.....	.....	.....	3.80	119 860	F	
30	44.3	.....	.....	.....	.....	3 82	120,590	F	
June... 1	44.4	.....	.....	.....	.....	4.28	134,910	F	
2	44.4	.....	.....	.....	.....	4.45	140,430	F	
3	44.4	.....	.....	.....	.....	4.40	138.930	F	
4	44.5	.....	.....	.....	.....	4 41	143.480	F	
5	44.6	.....	.....	.....	.....	4.55	148,210	F	
6	44.7	.....	.....	.....	.....	4.33	141,130	F	
8	45.0	.....	.....	.....	.....	4.38	142,680	F	
9	45.1	.....	.....	.....	.....	4 44	144.580	F	
10	45.2	.....	.....	.....	.....	4.46	145.110	F	
14	45.3	.....	.....	.....	.....	4.37	142,420	F	
15	45.3	.....	.....	.....	.....	4.35	141,770	F	
20	45.2	.....	.....	.....	.....	4.38	142,810	F	
21	45.2	.....	.....	.....	.....	4 33	140,950	F	
30	44.7	.....	.....	.....	.....	4.21	137,120	F	
July... 8	44.7	.....	.....	.....	.....	4.48	145,740	F	
13	43.8	.....	.....	.....	.....	4.20	132,510	F	
14	43.6	.....	.....	.....	.....	4.08	128,590	F	
15	43.3	.....	.....	.....	.....	3 95	120,520	F	
16	42.8	.....	.....	.....	.....	3.78	115,380	F	
17	42.1	.....	.....	.....	.....	3.72	109,880	F	
18	41.4	.....	.....	.....	.....	3.46	98,893	F	

ARKANSAS RIVER.

[Mouth 402 miles below Cairo.]

Napoleon, Ark.—Continued.

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1858.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
July...21	39.4					3.05	81,280	F	F = double floats.
26	38.1					2 89	74,297	F	
27	38.1					2 87	73,786	F	
Aug.... 1	37 8					2.81	72,316	F	
2	37.3					2.40	59,987	F	
3	35.9					2.28	55,188	F	
5	34.8					2.00	46,854	F	
8	32.2					1.59	33,544	F	
9	31.8					1.58	33,430	F	
11	30 8					1.44	29,312	F	
14	28.8					1.36	25,772	F	See notes on p. 135.
16	27.6					1 43	26,121	F	
17	27.1					1.40	24,688	F	
18	26 8					1.39	24.497	F	
20	26.1					1.36	23,096	F	
21	25.6					1.26	21,402	F	
22	25.1					1.01	16,489	F	
29	21.6					0.57	8,284	F	
30	20.8					0.55	7,561	F	
31	19.7					0.52	6,828	F	
Sept.... 2	18.4					0.52	6,317	F	
4	17.9					0.52	6,238	F	
5	17.8					0.51	6,212	F	
6	17.7					0.51	6,160	F	
7	17 2					0.51	5,826	F	
10	15 6					0.49	5,408	F	
11	15.1					0.49	5,123	F	
12	14.6					0.49	5,078	F	
13	14.1					0.48	4,761	F	
15	13.3					0.46	4,367	F	
16	13.2					0.46	4,367	F	
17	13.1					0 46	4,307	F	
18	13.5					0.47	4,644	F	
19	14.1					0 45	4,602	F	
20	14.6					0.46	4,754	F	
21	15.1					0 45	4,732	F	
22	15.6					0.45	4,927	F	
23	16.2					0.45	4,927	F	
24	16.7					0 45	5,147	F	
25	16 6					0.44	5,098	F	
26	16.1					0.46	5,098	F	
27	15.5					0 47	5,193	F	
28	15.1					0.47	4,887	F	
Oct.... 1	12.5					0.47	4,436	F	
2	12 1					0·47	4,164	F	
3	11.7					0.58	5,133	F	
4	11.3					0 46	3,884	F	
5	11.0					0 45	3,771	F	
6	10.5					0.48	4,021	F	
7	10.1					0.47	3,755	F	
14	8.5					0.45	3,412	F	
15	8.3					0.45	3,158	F	
16	8.1					0.46	3,276	F	
17	7 9					0.46	3,219	F	
18	7.7					0.46	3,219	F	
19	7.5					0.44	3,102	F	
20	7.3					0 44	2,933	F	
21	7.1					0 44	2,933	F	
22	7.0					0.44	2,915	F	
24	6.7					0.42	2,805	F	
25	6.5					0.42	2,753	F	
28	5.9					0.42	2,598	F	
29	5.7					0 41	2,546	F	
30	5.5					0.40	2,514	F	
31	5.3					0.40	2,348	F	

ARKANSAS RIVER.

[Mouth 402 miles below Cairo.],

Napoleon, Ark—Continued.

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1858.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Nov. .. 1	5.2	.....	.....	.... .	.....	0.40	2,348	F	F = double floats.
2	5.1	.....	.....	... ...	.....	0.40	2,383	F	S. F. = surface floats.
3	5.0	.....	.....	.....	.....	0.40	2,333	F	R = rod floats.
4	4.6	.....	.....	.....	.....	0.40	2,318	F	M = meter.
5	5.1	.....	.....	.....	.....	0.41	2,394	F	
6	6.1	.....	.....	.....	.....	0.45	2,774	F	
11	12.1	.....	.....	.....	.....	0 97	8,678	F	
12	13.4	.....	.....	.....	.....	1.06	9,935	F	
13	14.1	.....	.....	.....	.....	1 42	14,040	F	
14	14.5	.....	... ...	.....	.....	1.18	12,338	F	
19	14 8	.....	.....	.. ..	.....	1.20	12,565	F	
20	14 3	.....	.....	.....	.....	1.18	11.650	F	
21	13 5	.....	.....	.....	.....	1.11	11,007	F	For notes of 1858, see p. 135.
22	12.3	.....	.....	.....	... . .	1.06	9,450	F	
23	11.1	.....	.....	.....	.....	1.00	8,428	F	
24	9 7	.....	.....	.....	.....	0.93	7,409	F	
25	8.3	.....	.....	.....	.....	0 95	6,672	F	
26	7.5	.....	.....	.....	.....	0 86	6,040	F	
27	6.1	.....	.....	.....	.....	0.72	4,489	F	
28	5.6	.....	.....	.....	.....	0.64	3,958	F	
29	5.1	.....	.....	.....	.....	0.61	3,545	F	
30	5.1	.....	.....	.....	.....	0.58	3,379	F	
1882.									
March.28	46.2	.....	.....	.....	750	2.17	62,000	S. F.	

The gauge reading tabulated, 1882, is that of the U. S. Engineer gauge at the mouth of White River whose zero is 128.73 feet above the Cairo datum plane. Section was about 300 yards above the mouth. Observation and reduction under Secretary M. R. C. Report C. of E. 1885, p. 2611.

YAZOO RIVER.

[Mouth 595 miles below Cairo]

1858.	Below H.W.'58								
Feb....19	14.7	35,718	.....	.....	.....	1.22	43,628	F	Just below Steele Bayou whose mouth is 11 miles above the mouth of the Yazoo.
May.... 4	0.9	46,079	.....	.....	... ...	2.00	92,326	F	
12	0.8	46,156	.....	.....	.....	2.17	100,360	F	
June...11	0.4	46,541	.....	.....	.....	2 56	119,400	F	
July... 8	0.3	46.541	.....	.....	.....	2.87	133,580	F	
24	0.8	46,156	.....	.....	.....	3.02	139,210	F	16 miles above mouth.
1874.									
April..10	*43.8	33,347	.....	.....	.....	.....	66,217	S. F.	
1883.	Below H.W.'82								
March.16	8.0	47,250	61.1	.....	773	1.3	61,360	R	Just below Steele Bayou.
1884.	*								
March.18	46.5	42,253	.....	.....	.....	3.82	161,322	F	Near Chickasaw Bayou, 13 mls. ab'e mo.
1890.									
May....10	47.2	37,987	.....	.....	.....	.....	132,186	S. F.	L. N. O. & T. Ry. bridge.
10	.....	44,380	.....	.....	.....	.....	126,480	S. F.	Head Old Riv., 2 mls.
Nov....13	18 5	18,417	.. ..	.....	.....	.....	9,111	M	Mo. Chickasaw Bayou.
17	17.0	17,502	.....	.....	.....	.....	7,875	M	180 metres below L. N. O. & T. Ry. bridge.
1891.									
Nov....27	2.0	13,584	.....	.....	.....	.....	10,065	S. F.	Near L. N. O. & T. Ry. br.

Tabulation of 1858, Humphreys and Abbot's Report, p. 603. For remarks on the proportion of crevasse-water in these discharges see paper by Maj. H. L. Abbot, Report C. of E. 1875, Part I, p. 578.

Observations of 1874 under Maj. Benyaurd at L. N. O. & T. Ry. bridge, 16 miles above the mouth. Report C. of E. 1892, p. 1636.

* Vicksburg U. S. Engineer gauge whose zero is 96.04 feet above the Cairo datum plane.

Observations 1883 and 1884 under Secretary M. R. C. Report C. of E. 1885, pp. 2633 and 2650 respectively.

Observations of 1890 and 1891 under Capt. J. H. Willard. Tabulation, Report C. of E. 1892, p. 1636. Results of three observations in Chickasaw Bayou, May 9, 1890, ibid. The discharge at mouth was 7,169 cu. ft. per second.

Old River.

[Mouth 764 miles below Cairo.]

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1851.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Feb ...25	9.1	.....	.....	.....	.....	0	0	.....	F = double floats.
26	8.5	.....	.....	.....	.....	0	0	.....	S. L. = ship's log.
March. 9	4.2	.....	.....	.....	.....	0	0	.....	M = meter.
18	* 2 2	67,530	.....	.....	.....	1 48	100,080	S. L.	
20	1 9	67,996	.....	.....	.....	1.51	102,320	S. L.	
1858.									For notes see p. 140.
Feb....12	8.8	31,000	.....	.....	.....	2.46	76,112	F	
1880.	‡								
July... 8	25.6	16,858	.....	.....	.....	-2.34	-39,420	F	25.2
20	30.6	19,935	.....	.....	.....	-4.09	-81,604	F	30.0
Aug.... 7	20.1	12,180	.....	.....	.....	†0.89	†10,830	F	20.1
20	12.2	6,799	.....	.....	.....	†2.50	†17,021	F	13.0
Oct.... 11	7.6	3,923	.....	.....	.....	†1.06	† 4,238	F	8.3
1882									
Jan.... 9	34.5	23,461	26 4	35.7	890	-3.26	-76,400	F	
11	35.1	23,212	25 4	37.0	913	-3.25	-75,382	F	
16	36.0	22,389	24.3	38.7	923	-2 59	-58,031	F	
1884.									
Oct.... 8	10.6	6,426	11.5	19.0	558	-1.76	-11,334	M	
9	12.0	7,351	13.1	19.0	559	-2.17	-15,964	M	
10	13 2	8,427	15.0	20.0	560	-2.58	-21,287	M	
13	15.8	9,780	17.3	22.0	565	-2 97	-29.013	M	
15	16.5	10,327	18.1	24.0	569	-3.11	-32,086	M	
17	16.2	9,788	17.3	23 0	566	-2.80	-27,395	M	
22	15.2	9,147	16.2	24.0	565	-2.70	-24,682	M	
25	15 2	9,445	16.7	20.0	564	-2 68	-25,304	M	
Nov... 1	13 8	8,722	16 0	19.1	546	-2.46	-21,440	M	13.2
7	13.6	7,941	14.5	20.5	547	-2.56	-20,301	M	13 0
14	12.0	7,156	13.2	16.5	544	-1.99	-14,241	M	11.2
19	9.8	5,743	11.0	14.2	522	-1.42	- 8,158	M	9.0
21	9.0	5,371	10 3	13.7	520	-1.58	- 8,505	M	8.2
24	8.4	4,715	8.9	12.4	510	-1.31	- 5,911	M	7.6
29	7.8	4,123	8.2	11.5	500	-1.24	- 5,120	M	7.0
Dec.... 1	7.6	4,134	8.3	11.9	498	-1.30	- 5,387	M	6.8
5	8.6	4,902	9.4	11.9	519	-1.67	- 8,178	M	8.3
6	9.4	5,061	9.8	14.0	518	-1.74	- 8,811	M	8.9
8	10 0	5,413	10.4	14.0	520	-1.61	- 8,687	M	9.4
10	9.8	5,498	10.6	14.3	519	-1.47	- 8,101	M	9.1
12	9.4	5,249	10.4	14.0	507	-1 26	- 6,635	M	8.6
13	8.7	4,918	9.7	13.0	508	-1.17	- 5,734	M	8.0
16	8.0	4,456	8.9	11.5	500	0	0	M	7.5
17	7.6	4,198	8.4	10.5	497	0	0	M	7.3
19	8.8	5,202	10.1	13.0	516	-0.96	- 5,002	M	8.4
20	10.0	5,563	10.4	15.0	533	-1.42	- 7,878	M	9.7
22	13.2	7,729	14.2	18.4	543	-1.87	-14,446	M	12.9
23	14.4	8,218	15.0	20.0	548	-1 81	-14,891	M	14.0
24	15.1	8,901	16.1	19.8	554	-1.74	-15,523	M	14.7
26	16.0	8,814	15.7	20.5	562	-1.47	-12,929	M	15.5
30	18.0	10,867	18.0	22.9	602	†3.68	†39 9:6	M	17.9
31	19.2	11,961	19.6	27.0	611	†5.29	†63,271	M	19.6
1885.									
Jan.... 2	21 0	12,498	20.0	30.0	625	†5.35	†66,829	M	21.4
6	29.4	18,103	27.7	35 9	654	†1.52	†27,514	M	29.4
7	31.2	19,280	28.4	36.9	680	†0.87	†16,786	M	30.8
10	35.0	22,970	27.5	41.8	834	-0.88	-20,220	M	34.6
14	37.6	26,835	29.8	44.0	900	-0.77	-20,580	M	37 1
17	38.8	25,260	26.3	42 0	960	-1.14	-28,725	M	38.5
19	39.4	26,870	28.0	43.5	960	-0.84	-22,596	M	39.1
23	40.6	27,960	29.1	44 0	960	0	0	M	40 3
27	41.5	29,964	31.4	45.0	955	†1.12	†33,575	M	41.2
29	41.6	29,6 1	31.1	45.1	955	†0.74	†22,038	M	41.4
Feb.... 3	41.9	28,890	30.3	46.0	952	†1.06	†30,639	M	41.6
5	42 0	27,515	28.9	45.0	952	†1 19	†32,787	M	41.6
10	41.2	28,567	30.3	47.0	945	†1.56	†44,501	M	40.8
18	38.0	26,778	28.1	44.0	952	†2.87	†76,846	M	37.7
23	37.0	24,581	27.9	41.0	882	†2.32	†56,979	M	36.6

* Below H. W. of 1851.

‡ All readings in this column after 1858 were observed on the Red River Landing standard gauge whose zero is 23.35 feet above the Cairo datum plane.

- Signifies from the Mississippi River.

† Signifies toward the Mississippi River.

OLD RIVER.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1885.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Feb....25	36.8	24,693	28.2	41.0	877	†2 17	†53,594	M	36.4 M = meter.
27	36.0	24,929	28.7	41.5	870	†2.82	†70,283	M	35 6
March. 5	31.4	21,001	25.3	37.5	830	†4.72	†99,125	M	30.9
7	30.0	19,204	23.2	36 5	8282	†5.07	†97,354	M	29.5
18	31.3	20,212	24.1	36.5	838	†0.73	†14,8.3	M	31.2
19	31.9	19,882	23.8	36 0	835	†0.38	† 7,632	M	31 6
23	34.0	21,384	25.3	38.5	844	-0.78	-16,685	M	33.5
27	35.2	22,547	26.2	38.0	861	-1.14	-25,787	M	34.7
28	35.2	22,291	25.9	37.5	861	-1.11	-24,751	M	34 8
30	35.3	22,231	25.7	39.5	864	-1.06	-23 458	M	34 9
31	35.2	21,799	25.3	38.5	861	-0.94	-20,412	M	34.7
1889.									
Jan....22	27.5	13.576	20.1	28.0	676	-2.55	-34,672	M	.....
28	32.3	17,266	22.6	34.1	765	-3.10	-53,449	M	.....
Feb.... 1	33.2	17,949	22.9	34 8	783	-2.41	-43.324	M	.....
18	31.6	16,296	22.6	33.0	717	†2.44	†39,487	M	.....
21	29.0	15,317	22.3	33.3	687	†3.97	†60,774	M	.....
28	26.6	14,142	21.0	29 5	675	†3.08	†43,565	M	.....
March.11	33.8	18,329	23.5	33.9	780	-1.75	-32,095	M	.....
28	28.3	14,717	21.5	29.8	683	†1 75	†25,820	M	.....
April..28	25.8	12,338	18.7	26 4	661	†2.19	†26,977	M	.....
25	25.1	11,992	18 4	26 0	652	†2.35	†28,176	M	.....
27	24.8	11,705	17.9	25.3	655	†2.23	†26,147	M	.....
May...13	19.2	8,538	14.1	20.0	607	†3.18	†27,146	M	.....
18	16.4	6.800	11.4	16 8	597	†3.05	†20.764	M	.....
23	14.8	5,907	10.6	15.5	556	†2.81	†18,669	M	.....
27	13.7	4,922	9.3	12.3	532	†1.03	† 5,679	M	.....

Observations of 1851 near the mouth by party of Mr. G. C. Smith. Method of testing slack water not stated.

Observation of 1858 by Lieut. Abbot 3½ miles above Red River Ldg. Direction of flow not stated, but doubtless it was towards the Mississippi. Tabulation, Humphreys and Abbot's Report, p. 603.

Observations, 1880, under Maj. W. H. H. Benyaurd. Tabulation Report C. of E. 1881, p. 1398

In the last column is tabulated the readings of the local gauge at foot of Turnbull Island referred to the same zero as the Barbre Landing gauge which is 24.17 feet above the Cairo datum plane.

- Signifies from the Mississippi River.

† Signifies toward the Mississippi River.

Section, 1882, ¼ mile above the mouth. Observations under Secretary M. R. C. Tabulation, Report C. of E. 1890, p. 3149.

Section of 1884-5 about 2,000 feet below foot of Turnbull Island. Observations under Secretary M. R. C. Tabulation, Report C. of E. 1887, p. 2854. Report on work ibid., p. 2849.

Observations of 1889 under M. R. C. 4th district officer; reduction in the Secretary's office. Tabulation, Report C. of E. 1891, p. 3520. Report on work, ibid., p. 3516.

The section was 1,500 feet below the foot of Turnbull Island.

Red River.

[Mouth 9 miles above mouth of Old River.]

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1851.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
March. 2	* 6.2	68,947	.....	.....	.....	1.34	92,119	S. L.	At mouth.
9	* 4.2	74,357	.....	.....	.....	d 1.52	d 112,950	S. L.	
1858.									
Feb.... 1	† 6.6	22,685	.....	.....	.....	3.60	81,715	F	At Alexandria, 103 miles above mouth.
2	† 6.8	22,900	.....	.....	.....	3.93	90,075	F	
4	‡ 9.0	33,333	.....	.....	.....	3.94	131,330	F	Just below Black Riv. which is 21 miles above mo. Red Riv
1872.									
Feb....28	a 17.8	15,726	.....	.....	.....	.....	17,340	F	At Shreveport, La., 312 miles above mouth.
March. 4	b 179.1	6,329	.....	.....	.....	.....	18,682	F	About 10 miles below Shreveport.
11	b 172.2	4,951	.....	.....	.....	.....	13,031	F	Above Tones Bayou.
1879.									
Feb....24	15.1	13,364	.....	.....	.....	2.78	37,119	F	At Alexandria, La.
25	15.4	13,573	.....	.....	.....	2.78	37,715	F	Observations taken under direction of Maj. W. H. H. Benyaurd. The section was on a straight reach about 1 mile below Alexandria. Tabulation, Report C. of E. 1894, p. 2854. Report on work, ibid. p. 2856. The gauge readings are referred to the zero of the present U. S. Engineer gauge which is 64.46 feet above the Cairo datum plane.
28	15.3	13,499	.....	.....	.....	2.70	36,518	F	
March. 1	15.0	13,294	.....	.....	.....	2.73	36,296	F	
3	14.6	13,014	.....	.....	.....	2.73	35,566	F	
4	14.3	12,806	.....	.....	.....	2.67	34,246	F	
5	13.9	12,529	.....	.....	.....	2.66	33,375	F	
6	13.3	12,114	.....	.....	.....	2.66	32,281	F	
7	13.0	11,917	.....	.....	.....	2.66	31,640	F	
8	12.5	11,574	.....	.....	.....	2.56	29,637	F	
10	11.6	10,959	.....	.....	.....	2.53	27,690	F	
11	11.2	10,686	.....	.....	.....	2.50	26,750	F	
12	10.8	10,413	.....	.....	.....	2.53	26,344	F	
14	9 8	9,738	.....	.....	.....	2.56	24,955	F	
15	9.3	9,401	.....	.....	.....	2.44	22,893	F	
18	8.7	8,948	.....	.....	.....	2.62	23,486	F	
19	8.5	8,815	.....	.....	.....	2.50	22,040	F	
20	8.5	8,815	.....	.....	.....	2.52	22,211	F	
21	8.3	8,681	.....	.....	.....	2.61	22,651	F	
22	7 9	8,414	.....	.....	.....	2.62	22,074	F	
24	6.6	7,445	.....	.....	.....	2.55	18,971	F	
25	6.0	7,060	.....	.....	.....	2.50	17,629	F	
26	5.5	6,737	.....	.....	.....	2.54	17,107	F	
27	5.0	6,412	.....	.....	.....	2.50	16,003	F	
28	4 5	6,088	.....	.....	.....	2.44	14,878	F	
29	4.1	5,829	.....	.....	.....	2.52	14,687	F	
31	3.3	5,314	.....	.....	.....	2.37	12,573	F	
April.. 2	2.8	4,857	.....	.....	.....	2.56	12,455	F	
3	2.4	4,604	.....	.....	.....	2.58	11,890	F	
4	2.2	4,478	.....	.....	.....	2.48	11,126	F	
5	1.9	4,288	.....	.....	.....	2.44	10,478	F	
7	1.5	4,036	.....	.....	.....	2.49	10,066	F	
8	1.2	3,851	.....	.....	.....	2.44	9,402	F	
9	1.0	3,721	.....	.....	.....	2.36	8,773	F	
10	0.7	3,540	.....	.....	.....	2.58	9,149	F	
11	0.5	3,416	.....	.....	.....	2.46	8,422	F	
12	0.2	3,290	.....	.....	.....	2.40	7,743	F	
14	0.4	3,458	.....	.....	.....	2.41	8,340	F	
15	0 3	3,396	.....	.....	.....	2.40	8,164	F	
16	1.8	4,328	.....	.....	.....	2.51	10,845	F	
18	3.9	5,662	.....	.....	.....	2.72	15,408	F	
19	4.6	5,982	.....	.....	.....	2.68	15,919	F	
23	4.6	5,982	.....	.....	.....	2.61	15,476	F	
26	10.8	9,563	.....	.....	.....	3.45	32,973	F	
28	15.0	12,461	.....	.....	.....	3.26	40,560	F	
29	14.7	12,255	.....	.....	.....	3.02	37,011	F	
30	13.7	11,561	.....	.....	.....	2.89	33,400	F	
May... 1	12.9	11,262	.....	.....	.....	2.82	31,805	F	
2	11.9	10,572	.....	.....	.....	2.68	28,308	F	
3	10 9	9,887	.....	.....	.....	2.60	25,731	F	
5	9.4	8,768	.....	.....	.....	2.61	22,845	F	
6	9.4	8,768	.....	.....	.....	2.76	24,218	F	
7	10.6	9,681	.....	.....	.....	2.87	27,749	F	
8	11.4	10,229	.....	.....	.....	2 83	28,967	F	
9	11.8	10,503	.....	.....	.....	2.81	29,503	F	

S L = ship's log.
F = double floats.
* Below H. W. of 1851.
† Below H. W. of 1858.
‡ Below H. W. of (?)

(a) The water surface referred to the zero of the U. S. Engineer gauge at Shreveport, which is 161.27 feet above the Cairo datum plane.
(b) The water surface referred to the Cairo datum plane.
(d) Velocity observed at only one station which showed 1.87 per second. See also Atchafalaya River.

Red River.—*Continued.*

[Mouth 9 miles above mouth of Old River.]

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1879.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
May...10	12.3	10,848	.....	.....	.....	2.85	30,917	F	Alexandria contin'd.
12	13.5	12,140	.....	.....	.....	2.95	35,767	F	F = double floats.
13	13.8	12,346	.....	.....	.....	2.97	36,721	F	R = rod floats.
14	14.3	12,693	.....	.....	.....	3.05	38,733	F	
15	14.8	13,046	.....	.....	.....	3.10	40,384	F	
16	15.3	13,399	.....	.....	.....	3.07	41,133	F	
17	15.8	13,751	.....	.....	.....	3.08	42,363	F	
19	17.0	14,632	.....	.....	.....	3.16	46,161	F	
20	17.3	14,844	.....	.....	.....	3.19	47,385	F	
21	17.7	15,128	.....	.....	.....	3.26	49,348	F	
22	18.1	15,409	.....	.....	.....	3.28	50,203	F	
23	18.3	15,553	.....	.....	.....	3.18	49,526	F	
24	18.6	15,708	.....	.....	.....	3.14	49,437	F	
26	18.6	15,864	.....	.....	.....	3.17	50,283	F	
27	18.4	15,723	.....	.....	.....	3.11	48,957	F	
28	18.2	15,580	.....	.....	.....	3.10	48,378	F	
29	17.9	15,367	.....	.....	.....	3.03	46,606	F	
30	17.4	15,013	.....	.....	.....	2.99	44,900	F	
31	16.9	14,659	.....	.....	.....	2.98	43,716	F	
June... 4	14.4	12,762	.....	.....	.....	2.83	36,088	F	
5	13.7	12,277	.....	.....	.....	2.80	34,394	F	
6	12.9	11,724	.....	.....	.....	2.77	32,466	F	
7	12.2	11,243	.....	.....	.....	2.75	30,886	F	
9	10.2	9,705	.....	.....	.....	2.71	26,265	F	
10	9.6	9,298	.....	.....	.....	2.71	25,218	F	
11	8.7	8,690	.....	.....	.....	2.71	23,557	F	
12	7.8	8,090	.....	.....	.....	2.70	21,807	F	
13	6.9	7,453	.....	.....	.....	2.65	19,750	F	
14	6.4	7,145	.....	.....	.....	2.71	19,334	F	
16	5.2	6,358	.....	.....	.....	2.74	17,405	F	
17	4.7	6,033	.....	.....	.....	2.71	16,332	F	
18	4.1	5,646	.....	.....	.....	2.60	14,678	F	
19	3.7	5,388	.....	.....	.....	2.60	14,027	F	
20	3.2	4,979	.....	.....	.....	2.58	12,858	F	
21	2.7	4,660	.....	.....	.....	2.56	11,910	F	
23	1.9	4,153	.....	.....	.....	2.63	10,921	F	
24	1.6	3,994	.....	.....	.....	2.66	10,554	F	
25	1.2	3,714	.....	.....	.....	2.65	9,845	F	
26	0.9	3,527	.....	.....	.....	2.60	9,176	F	
27	0.6	3,341	.....	.....	.....	2.57	8,575	F	¶ The gauge readings tabulated are those of the Barbre Ldg. gauge, whose zero is 24.17 feet above the Cairo datum.
28	0.3	3,156	.....	.....	.....	2.68	8,305	F	
30	—0.2	3,107	.....	.....	.....	2.55	7,869	F	
July... 1	—0.5	2,923	.....	.....	.....	2.58	7,544	F	
1879-80. 1880.	Near L. W. ¶	9,050	.....	.....	.....	1.19	10,775		L. W. Section of 1879-80, below Black Riv.
July... 5	23.7	43,126	.....	.....	.....	0.55	23,851	F	Above mouth over 4 mile.
19	29.3	49,792	.....	.....	.....	.....	6,694	F	Retarded by back water from the Mississippi through the Old River.
Aug... 6	20.8	40,315	.....	.....	.....	1.31	52,766	F	
18	15.1	33,219	.....	.....	.....	1.56	51,731	F	
Oct.... 9 1881.	10.1	25,553	.....	.....	.....	1.08	27,506	F	
Oct....25	14.9	.....	.....	.....	.....	0.89	10,557	....	Above Sugar House Chute.
Dec....28 1883.	24.8	39,768	31.6	.....	1,257	0.72	28,774	F	Near mouth.
Dec....16 1887.	—0.3	16,619	16.9	.....	986	0.44	7,298	F	
Dec.... 2	1.3 a	11,885	.....	.....	.....	0.99	11,853	R	8½ miles above Turnbull Island.
Feb.... 3	5.0	6,114	.....	.....	.....	.....	5,156	R	Above Tones Bayou (outlet), about 18 miles below Shreveport.
8	4.6	5,985	.....	.....	.....	.....	5,403	R	
10	5.3	6,114	.....	.....	.....	.....	5,368	R	
11	5.6	6,103	.....	.....	.....	.....	6,427	R	

a For notes see p. 143.

Red River.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1887.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
	a								
Feb....12	6.5	6,512	.....	.....	.....	.....	7,027	R	Above Tones Bayou.
15	8.5	7,513	.....	.....	.....	.....	9,858	R	M = meter.
16	9 0	7,782	.....	.....	.....	.....	10,983	R	R = rod floats.
18	10 0	8.116	.....	.....	.....	.....	12,715	R	F = double floats.
21	11.7	8,928	.....	.....	.....	.....	16,915	R	
22	12.2	9,074	.....	.....	.....	.....	15,538	R	All observations on the Red River, 1887-91, except when otherwise stated, were taken under Capt. J. H. Willard and results published, in metres, in Report C. of E. 1893, p. 1985 et seq.
23	12.7	9,742	.....	.....	.....	.....	15,897	R	
24	13.4	9,957	.....	.....	.....	.....	21,682	R	
25	14.0	10,097	.....	.....	.....	.....	18,540	R	
28	15.6	10,829	.....	.....	.....	.....	20,623	M	
March. 1	15.9	10,893	.....	.....	.....	.....	19,034	M	
3	16.1	10,807	.....	.....	.....	.....	20,694	M	
4	16.2	10,807	.....	.....	.....	.....	19,917	M	
5	16.2	10,807	.....	.....	.....	.....	21,436	M	
7	16.6	11,033	.....	.....	.....	.....	22,848	M	a The gauge readings tabulated are those of the U. S. Engineer gauge at Shreveport whose zero is 161.27 feet (preliminary value) above the Cairo datum plane.
1891.									
April..20	13.9	10,021	.....	.....	.....	.....	24,191	M	
21	14.2	10,021	.....	.....	.....	.....	23,626	M	
23	15 6	10,667	.....	.....	.....	.....	27,087	M	
24	16.0	10,829	.....	.....	.....	.....	27,511	M	
25	16.2	10,979	.....	.....	.....	.....	27,723	M	
27	16 8	11,141	.....	.....	.....	.....	29,135	M	
28	17 2	11,302	.....	.....	.....	.....	31,078	M	
Feb...23	23.5	20,527	.....	.....	.....	.....	50,289	M	At Shreveport, below railroad bridge.
26	22.2	19,634	.....	.....	.....	.....	45,840	M	
28	21.4	19,203	.....	.....	.....	.....	44,886	M	
May... 4	20.6	7,567	.....	.....	.....	.....	28,253	M	Below Loggy Bayou (tributary); about 68 miles below Shreveport.
5	21.7	7,707	.....	.....	.....	.....	30,536	M	
6	22.6	7,912	.....	.....	.....	.....	30,124	M	
7	23.2	7,987	.....	.....	.....	.....	31,784	M	
8	23.9	8,127	.....	.....	.....	.....	31,784	M	
9	24.2	8,202	.....	.....	.....	.....	31,219	M	
	e								
14	18.0	14,682	.....	.....	.....	.....	55,622	M	Below Bayou Wincy (tributary), about 5 miles below Coushatta, La.
15	17.9	14,682	.....	.....	.....	.....	55,728	M	
16	17.8	14,682	.....	.....	.....	.....	58,150	M	
18	17.6	14,402	.....	.....	.....	.....	52,691	M	e Coushatta gauge, 229 miles above mouth of Red River, whose zero is 115.92 feet above the Cairo datum plane.
19	17.4	14,144	.....	.....	.....	.....	50,572	M	
20	17.1	13,917	.....	.....	.....	.....	49,571	M	
21	16.7	13,617	.....	.....	.....	.....	47,182	M	
22	16 3	13,337	.....	.....	.....	.....	46,016	M	
23	15.9	13,078	.....	.....	.....	.....	44,427	M	
28	13.6	9,505	.....	.....	.....	.....	35,704	M	Above head of Cane River (outlet) about 54 miles below Coushatta.
29	13.1	9,193	.....	.....	.....	.....	34,044	M	
30	12.6	9,042	.....	.....	.....	.....	31,643	M	
June.. 1	11.7	8,288	.....	.....	.....	.....	28,500	M	
2	11.2	8,159	.....	.....	.....	.....	26,875	M	
3	10.8	8,030	.....	.....	.....	.....	25,780	M	
4	10.4	7,761	.....	.....	.....	.....	24,408	M	
5	10.0	6,555	.....	.....	.....	.....	24,262	M	
8	9.1	7,944	.....	.....	.....	.....	21,507	M	Below mouth of Cane River (tributary), about 86 miles below Coushatta.
9	8.8	7,793	.....	.....	.....	.....	21,437	M	
10	8.5	7,632	.....	.....	.....	.....	20,907	M	
11	8 3	7,632	.....	.....	.....	.....	21,119	M	
12	8.1	7,470	.....	.....	.....	.....	20,165	M	
	‡								
13	7.4	6,788	.....	.....	.....	.....	19,141	M	At Alexandria.
15	7.2	6,544	.....	.....	.....	.....	19,671	M	
16	7.2	6,641	.....	.....	.....	.....	19,282	M	‡ The gauge readings tabulated are those of the U. S. Engineer gauge as reported by the regular observer. The zero of this gauge is 64.46 feet above the Cairo datum plane.
17	7.7	6,824	.....	.....	.....	.....	20,059	M	
18	8.2	7,255	.....	.....	.....	.....	21,366	M	
19	8.6	7,535	.....	.....	.....	.....	22,355	M	
20	9.1	7,847	.....	.....	.....	.....	23,803	M	
22	9.8	8,235	.....	.....	.....	.....	26,946	M	
23	10 2	8,644	.....	.....	.....	.....	26,769	M	
24	10 4	8,784	.....	.....	.....	.....	26,946	M	
25	10 8	8,773	.....	.....	.....	.....	27,193	M	

RED RIVER.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1891.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
June...26	11.0	8,913					27,582	M	Alexandria contin'd.
27	11.2	9,139					27,723	M	M = meter.
29	11.3	9,451					29,347	M	F = double floats.
30	11 3	9,171					28,041	M	
July... 1	11.3	9,289					28,076	M	
2	11.4	9,193					28,712	M	
3	11.3	9,171					28,358	M	
4	11.2	9,139					28,570	M	
6	11.0	9,010					27,652	M	
7	11.8	9,429					29,312	M	
8	12.6	9,914					29,948	M	
9	13.0	10,247					31,587	M	
10	12.8	10.344					32,137	M	
11	12.0	9,86)					29,383	M	
13	10.0	8,633					24,933	M	
14	9.1	8,601					24,580	M	
15	8.4	7,664					22 284	M	
16	7.9	7,884					21,472	M	
28	4.2	4,919					12,820	M	
29	3.9	4,822					12,219	M	For notes see p. 145.
30	3.6	4.489					11,619	M	
31	3.2	4,263					10,948	M	
Aug....1	3.0	4,155					10,383	M	
3	2.4	3,735					9,323	M	
4	2.2	3,617					8,900	M	
5	2.0	3,531					8,617	M	
6	2.0	3,595					8,794	M	
7	2.2	3,628					9,147	M	
8	2.7	3,897					10,171	M	
10	3.8	4,596					12,184	M	
11	4 2	4,930					13,632	M	
12	4.4	5,296					14,444	M	
13	4.8	5,339					14,903	M	
14	5.1	5,608					15,589	M	
15	5.2	5,727					15,963	M	
17	5.7	5,748					16.245	M	
18	5 8	5,909					16,634	M	
19	5.9	6,071					17,057	M	
20	6.0	5,909					17,022	M	
21	5.9	5,877					16,987	M	
22	5.8	5,813					16 316	M	¶ The gauge readings tabulated are those of the M.R.C. gauge at Barbre Landing, as reported by the regular observer. The zero of this gauge is 24.17 feet above the Cairo datum plane.
24	5.4	5,748					15,751	M	
25	5.2	5,608					15,009	M	
26	5.0	5,339					14,656	M	
27	4.7	5,339					14,515	M	
28	4.4	5,350					14,056	M	
29	4.0	5,156					13,600	M	
31	3.5	4,833					12.714	M	
Nov...17	−1.7	2,228					4,203	F	
	¶								
Dec.....21	9.6	4,230					6,533	M	Above Black River whose mouth is 28 miles above Barbre Landing.
July...18	23.8	19,332					44,921	M	Below Black River.
19	23.2	19,472					45.910	M	
20	22.4	18,977					44,780	M	
21	21.6	18,460					41,143	M	
22	21.0	17,976					41,213	M	
23	20.4	17 481					38,747	M	
24	19 8	16,997					36 698	M	
25	19.2	16,501					36,375	M	
Oct....22	— 0.2	10,930				1.09	11,968	M	Below Red Riv. dam.
27	0.5	2,742				3.98	10,915	M	On Red River dam.
Nov ... 6	— 0.9	1,646				4.58	7,544	M	On Red River dam.
6	— 0.9	9,480				0.78	7,373	M	Below Red Riv. dam.

RED RIVER.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1892.	feet. ‡	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
May....26	28.2	23,713	30.5	38.0	777	3.82	90,572	F	At Alexandria, La.
27	29.5	24,524	31.6	38.0	777	4.14	101,604	F	
28	30 6	25,381	32.5	40.0	781	4.06	102,908	F	
31	33.7	26,890	34.1	43.0	788	4.12	110,848	F	
June... 1	34.5	29,239	36.8	46.0	795	4.72	138,042	F	
2	35.0	29,434	36.8	46 0	800	4.92	144,890	F	F = double floats. M = meter.
3	35.6	29,353	36 5	46.0	805	4.86	142,814	F	
4	36.1	29,528	36.5	47.0	810	4 94	145,969	F	
6	37.0	30,298	37.1	47 0	817	4.92	149.017	F	
7	37.5	31,482	38 5	48.0	817	5.10	160,579	F	
8	37.8	31,912	39.0	51.0	819	5.46	174,210	F	
9	37 8	30,627	37.4	48 0	819	5 48	167,952	F	
10	37.9	32,721	40.0	50.0	819	5.53	181,092	F	
11	38 1	30,894	37.7	49.0	819	5 56	171,820	F	
13	38.2	33,123	40 4	49.0	820	5.49	181,781	F	
14	38.2	31,925	38 9	50.0	820	5.32	169,804	F	
15	38.0	32 574	39.7	49.0	820	5.60	182,563	F	
10	37.9	31,646	.....	.....	.....	.....	‖190,881	M	At Alexandria, La., below R. R. bridge.
11	38.1	31,646	.....	.....	.....	.....	‖187,173	M	Observations by Capt. J. H. Willard.
13	38.2	31,937	.....	.....	.....	.....	‖188,197	M	
14	38.2	31,937	.....	.....	.....	.....	‖180,286	M	
15	38 1 a	31,646	.....	.....	.....	.....	‖182,405	M	
May....30	35.0	34,897	.....	.....	.....	.....	227,504	M	At Shreveport, La.
June... 1	34.4	34,379	.....	.....	.....	.....	216,133	M	Observations by Capt. J. H. Willard. Tabulation, Report C. of E. 1893, p. 1990.
3	33.6	33,821	.....	.....	.....	.....	202,747	M	
6	32.2	32,744	.....	.....	.....	.....	166,161	M	
1893.									
Feb....11	11.8	14,736	.....	.....	.....	.....	24,686	M	
16	10.0	8,052	.....	.....	.....	.....	18,329	M	Below Tones Bayou (outlet).
Nov.... 1	—1.2	1,367	.....	.....	.....	.....	4,132	M	Below Tones Bayou, La., 299 miles above mouth.
Oct.....23	1.0	1,432	.....	.....	.....	.....	f 3,990	M	Above Twelve Mile Bayou, 318 miles above mouth.

‡ The gauge readings tabulated are those of the U. S. Engineer gauge whose zero is 64.46 ft. above the Cairo datum plane. The readings were taken by the M. R. C. party during their work; the readings of the regular observer have been used for the other series.

‖ Overflow observations taken June 10-15 below the bridge showed discharges on the left bank from 212 to 706 cu. ft. per second, and on the right bank from 1271 to 1730 cu. ft. per second.

Bayou Philip (tributary) showed discharges on the same days as follows: 8935, 9888, 11018, 8985 and 8864 respectively. Bayou Rapides (tributary) showed discharges June 11-15 as follows: 6781, 5156, 4874 and 4309 respectively.

* Elevation of water surface above Cairo datum. The discharge of Cane River Feb. 28 was 777 cu. ft. per second.

a The gauge readings are those of the U. S. Engineer gauge whose zero is 161.27 feet above the Cairo datum plane.

f Twelve Mile Bayou (tributary) discharged at the same time 636 cu. ft.

RED RIVER.—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1893.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
Feb.....21	a 11.8	5,457	.....	.....	.....	.....	19,141	M	Above Loggy Bayou (tributary).
Aug....26	g 9.6	3,688	.....	.....	.....	.....	8,617	M	At Kye Smith Place, Ark., 11 miles below Fulton.
Sept... 1	*240.1	3,826	.....	.....	.....	.....	4,450	M	At Dooley Ferry, Ark., 480 mls. above mo.
15	h 8.0	3,466	.....	.....	.....	.....	2,472	M	At Garland, Ark., 448 miles above mouth.
25	*117.8	1,216	.....	.....	.....	.....	2,790	M	At Coushatta, La.
Aug....24	*121.6	3,886	.....	.....	.....	.....	10,100	M	" Stone line 21.
Feb....28	*107.0	20,915	.....	.....	.....	.....	38,353	M	Below Cane River (outlet).
March. 7	114.3	12,346	.....	.....	.....	.....	35,683	M	At Alexandria, La.
Oct.... 7	‡—0 3	2,659	.....	.....	.....	.....	4,944	M	
21	* 51.2	5,059	.....	.....	.....	.....	10,877	M	At Barbin Ldg., La., 57 miles above mo.
March.14	¶37.4	17,955	.....	.....	.....	.....	29,771	M	Above Black River.
Oct....30	¶ 2.4	2,282	.....	.....	.....	.....	6 710	M	
30	¶ 2.4	6,620	.....	.....	.....	.....	9,484	M	Below Black River.
1894.									
Sept....24	*210.1	1,173	....	.....	.....	.....	j 2,154	M	Above Sulphur River, 398 miles above mo.
Oct.... 8	a—3.6	1,346	.....	.....	.....	.....	3,531	M	At Shreveport.
Nov....19	‡—1.8	2.788	....	.....	.....	.....	3,143	M	Above Alexandria.

Tabulation, 1851 and 1858, Humphreys and Abbot's Report, p. 618.

In 1851 the maximum discharge at mouth was 220,000 cu. ft. per second, and in 1858 it was 180,000 cu. ft. per second, no crevasse water in either case being included. Maj. H. L. Abbot, Report C. of E. 1875, Part I, p. 579.

Tabulation of 1872 by Capt. J. H. Willard. Report C. of E. 1893, p. 1984.

Observation of 1879-80, Maj. W. H. H. Benyaurd, Report C. of E. 1880, p. 1295. At the same time the Atchafalaya discharge was 16,950 cu. ft. per second. Ibid.

Observations, 1880 and 1881, under Maj. W. H. H. Benyaurd. Tabulation, Report C. of E. 1881, p. 1398, and 1882, p. 1588, respectively, except as noted below.

Observation, Dec. 28, 1881, under Secretary M. R. C. Report C. of E. 1889, p. 2649.

Observation of 1883 under M. R. C. 4th district officer. Reduction in Secretary's office. Report C. of E. 1889, p. 2649.

Dec. observation, 1887, under M. R. C. 4th district officer. Report C. of E. 1888, p. 2310.

Observations and reduction of Oct. and Nov. 1891, by M. R. C. 4th district officer. Tabulation, Report C. of E. 1892, p. 3215.

Observations of 1892 taken by M. R. C. 4th district officer. Reduction in Secretary's office.

Tabulation, 1892, Report C. of E. 1893, p. 3693. Report on work, ibid. pp. 3674, 3681. Overflow was measured June 9 and 14, and found to be 679 and 1274.

Observations of 1893 and 1894 taken under Capt. J. H. Willard. Tabulation for H. W. 1893, Report C. of E. 1893, p. 1990. L. W., Report C. of E. 1894, p. 1418.

Observations of 1894 from MS. of Capt. J. H. Willard.

g The gauge reading is that of the U. S. Engineer gauge at Fulton, Ark., whose zero is 244.78 ft. above the Cairo datum plane. Fulton is 506 miles above mouth.

h The gauge reading is that of the U. S. Engineer gauge at Garland, whose zero is 223.44 ft. above the Cairo datum plane.

j Sulphur River discharged at the same time 318 cu. ft.

¶ The gauge readings tabulated are those of the M. R. C. gauge at Barbre Ldg. whose zero is 24.17 feet above the Cairo datum plane.

a, *, ‡ } See preceding page.

TRIBUTARIES OF RED RIVER.

Loggy Bayou.

[Mouth 256 miles above mouth of Red River.]

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
1893.									
Feb....12	.....	2,712	.....	.....	.....	.....	3,895	M	M = meter.

Capt. J. H. Willard, Report C. of E. 1893, p. 1991.

Black River.

[Mouth 24 miles above mouth of Red River.]

1858.	Below H.W.'50								F = double floats.
Feb.... 4	8.4	24,845	.....	.....	.....	2.28	55,526	F	Just above mouth.
1891.	•								
July...13	23.8	15,726	.....	.....	.....	.....	18,682	M	
20	22.4	15,177	.....	.....	.....	.....	19,070	M	
21	21.6	14,811	.....	.....	.....	.....	18,505	M	
22	21 0	14,445	.....	.....	.....	.....	18,223	M	
23	20.4	14,090	.....	.....	.....	.....	16,881	M	
24	19.8	13,724	.....	.....	.....	.....	16,422	M	
25	19 2	13,369	.....	.....	.....	.....	15,751	M	
26	18.9	13,197	.....	.....	.....	.....	14,550	M	
27	18.5	13,014	.....	.....	.....	.....	14,550	M	
1893.									
March.14	37.4	24,531	.....	.....	.....	.....	39,836	M	
1894									
Oct....30	2.4	4,715	.....	.....	.....	.....	3,461	M	

Observation of 1858, Humphreys and Abbot's Report, p. 603.
Observations and reduction 1891 and 1893 under Capt. J. H. Willard. Tabulation, Report C. of E. 1893, pp. 1989, 1991.
• Barbre Landing M. R. C. gauge whose zero is 24.17 feet above the Cairo datum plane.

Ouachita River.

[Mouth 54 miles above mouth of Black River.]

	Above L.W.								At Monroe, La., 198 miles above mouth of the Ouachita.
1872.	1.0	.....	.....	.....	.....	.....	800	.....	
1873.	0.0	.....	.....	.....	.....	.....	353	F	At Camden, 403 miles above mouth.
1890.									
Aug.....	3.3	.....	.....	.....	.....	.....	3,859	S. F.	Near Harrisonburg,
	3.3	.....	.....	.....	.....	.....	3,920	S. F.	10 mls. above mouth
1892.	†	‡							S. F. = surface floats.
May..31	37.6	24,891	31.1	.....	800	2.22	55,180	F	At Monroe, La.
June... 1	37 8	25.075	31.3	.....	800	2.24	56,182	F	

Observation of 1872, Gen. W. F. Reynolds, Report C. of E. 1872, p. 370.
Observation of 1873, Maj. W. H. H Benyaurd, Report C. of E. 1874, p. 360.
Observations of 1890, Capt. J. H. Willard, Report C. of E. 1891, p. 1988.
Observations of 1892, taken under M. R. C., 2nd district officer. Reduction in Secretary's office. Tabulation, Report C. of E. 1893, p. 3694. Report on work, ibid. pp. 3673, 3681.
† Monroe gauge whose zero is 51.55 feet above the Cairo datum plane.
‡ Based on soundings of May 30, corrected for change of stage.

Bayou Bartholomew.

[Mouth 176 miles above mouth of Ouachita.]

1892.	Below H.W.								
June...10	4.0	8,104	19.5	.....	416	0.8	6,483	S. F.	At Brown's Bridge.

Observation and reduction under M. R. C., 3rd district officer. Report C. of E. 1893, p. 3701. The inlets into the bayou below the bridge discharged 2608 cubic feet per second. Ibid.

k Amos Bayou.

1890.	.....	.....	.....	.....	.....	.....	50,000	.....
1891.	.....	.....	.....	.....	.....	.....	5,000	.....
1892.	.....	.....	.....	.....	.....	.....	300,000	.....
1893.	.....	.....	.....	.....	.....	.....	97,000	.....

k Maximum discharge as measured along the railroad from Arkansas City to Trippe, Ark. Capt. Townsend, Report C. of E. 1893, p. 3760. See also pp. 156 and 158 herein.

ATCHAFALAYA RIVER.

[Head 2 miles below mouth of Red River, 7 miles above mouth of Old River.]

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1851.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
March. 8	4.4	22,510	.....	.....	.....	4.37	98,359	F	At head of river.
9	4.2	22,115	.....	.....	.....	4.73	104,550	F	Tabulation, Humphreys and Abbot's Report, p 603.
1858.									
Feb....11	8.3	22,482	.....	.....	.....	3.43	77,061	F	* Stage at Red River Ldg. below H.W.'51
1873.									At head of river.
Dec....29	†32.4	.....	.....	.....	.....	.....	122,000	F	Capt. C. W. Howell, Report C. of E. 1874, p. 772.
1879.	Near L. W.	.....	.....	.....	.....	.....	16,950	....	½ mile below head. Report C. of E. 1880, p. 1295.
1880.	‡								
July... 6	24.1	21,383	.....	.....	.....	3 08	65,780	F	Tabulation, Report C.
21	29.7	24,717	.....	.....	.....	3.50	86,531	F	of E. 1881, page 1398.
Aug.... 5	21.7	19,618	.....	.....	.....	2.53	49,644	F	Remarks on the proportion of Miss. Riv.
19	14.8	15,684	.....	.....	.....	2.05	32,144	F	water in the Atchafalaya, ibid. p. 1394
Oct.... 8	10.2	13,178	.....	.....	.....	1.80	23,758	F	
1881.									½ of a mile below head
Oct.....25	14.9	.....	.....	.....	.....	2.02	29,481	F	Tabulation, Report C. of E. 1882, p. 1538.
Dec....13	29.8	24,860	33.6	68.0	739	4.07	101,146	F	
15	28.8	22,500	30.6	64.0	735	3.59	80,832	F	The observations of
21	23.6	18,660	31.4	60.1	592	3.26	60,891	F	1879, 1880, and Oct.
23	22.7	18,320	31.2	60.0	586	2.84	52,100	F	1881, were taken un-
26	23.2	18,620	30.6	59.6	604	3 12	57,753	F	der Maj. W. H. H.
28	25.2	19,320	30.8	62.0	625	3.44	66,377	F	Benyaurd.
29	26.2	19,080	30 0	64.1	635	3.37	64,355	F	
1882.									‖ Red River Landing gauge, whose zero is 23 85 feet above the Cairo datum plane.
Jan.... 4	30.8	25,140	33.6	69 0	746	4.04	101,477	F	‡ Barbre Ld'g. standard gauge, whose zero is 24'.17 above the Cairo datum plane
¶ 6	31.8	25,160	33.4	67.0	751	3.55	89,492	F	
10	33.6	26,630	33.3	64 0	799	4.17	111,316	F	
12	34.1	27,380	33 5	67.0	815	4.25	116,242	F	
Feb....21	44.0	33,940	41.2	81.0	822	4.89	166.030	F	¶ Observ'n doubtful.
March. 6	47.0	37,500	a 36.7	85 0	1,022	4.82	180,949	F	
7	47.1	40,340	38.4	85 5	1,050	5.02	202,576	F	
10	48.0	39,340	37.4	87.5	1,050	5.09	200,180	F	a Decrease of mean depth is owing to a ledge 200 feet wide becoming submerged by slight rise, increasing water width.
13	48.5	40,260	38.0	89.0	1,059	5.98	240,814	F	
14	48.6	39,880	37.6	90.0	1,059	5.73	228,621	F	
15	48.7	41,000	38.6	90 0	1,059	5.62	230,313	F	
16	48.8	39,840	37.6	90.3	1,059	5.97	237,841	F	
17	48.9	40,480	38.5	87.0	1,050	5.71	231,516	F	
18	49.0	40,080	38.5	90 0	1 040	5.60	224,555	F	
22	49.3	39,400	38.2	87.0	1,030	5.49	216,162	F	F =double floats.
23	49 4	38,160	37.0	86 0	1,030	6 19	236.287	F	Observations and reduction Dec. 13, 1881-
24	49 5	38,380	37.2	90.0	1,030	5 45	209,009	F	Nov. 16, 1882, under
28	49.8	38,150	37.9	90.0	1,030	6.92	264,050	F	Secretary M. R. C.
29	49.7	38,940	38.3	89.0	1,030	7.05	274,498	F	
30	49.7	39,160	38.0	88.0	1,030	6.91	270,480	F	
31	49.7	38,500	37.3	88.0	1,030	7.29	280,613	F	The sec'n was about 1500 feet below the head of the river. The gauge readings tabulated are those of the Barbre Ldg. standard gauge as found by interpolating on the hydrograph for the mean time of discharge. Tabulation, Report C. of E. 1884, p. 2651. Report on observations, ibid. p. 2636.
April 1	49.6	38,060	36.9	86.0	1,030	6.30	240,047	F	
3	49.4	38,120	37.0	88.0	1,030	5.01	190,858	F	
4	49.3	38,060	36 9	88.5	1,030	6.50	247,291	F	
6	49.0	37,900	36.7	84.5	1,030	5.50	208,674	F	
7	48.9	38,480	37.3	84.5	1,030	5.43	208,935	F	
10	48.6	38,680	37.5	86.5	1,030	5 58	215,643	F	
11	48.5	38,500	37.3	88.0	1,030	5.11	196,812	F	
12	48 4	38,060	37.0	89.0	1,027	5.24	199 360	F	
15	48.1	37,580	36.5	86.0	1,027	5.15	193,065	F	
17	47.8	37,160	36.3	86.5	1,023	5 62	208.638	F	
18	47.7	37,680	36.5	86 0	1,021	4.89	184,116	F	
19	47.5	37,160	36.4	86.0	1,019	5.72	212,473	F	
20	47.4	36,760	36 0	86.0	1,020	5.15	189.455	F	
21	47.2	37,040	36 2	89.0	1,021	5.91	218,967	F	
24	47.0	36.780	35.5	85.6	1,030	5 81	213,718	F	
25	46.9	36,760	36.0	86.3	1,020	5.45	200,248	F	

ATCHAFALAYA RIVER.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1882.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
April..26	46.8	34,320	35 6	87.0	1,018	5.62	204,212	F	Section 1500′ below head, continued.
27	46.6	36,640	36.0	88 0	1,017	5.50	201,549	F	
28	46.5	35,520	b 43.8	88.0	810	6.13	217 777	F	M = meter.
29	46.3	35,740	43.9	86.0	812	5 89	210,408	F	F = double floats.
May.... 2	45.8	35,540	44.4	84.0	809	5.56	197,574	F	b Increase in mean depth is owing to flat ledge appearing above water, narrowing width.
3	45.6	35,380	44.0	86 0	814	5.51	197.652	F	
5	45.3	35,580	44.7	85.0	795	6.08	215,502	F	
6	45.1	36,180	45.3	86.0	798	5.90	213,422	F	
8	44.9	35,160	43.9	86 0	801	5.83	204,997	F	
10	44.7	35,480	45.1	84.5	786	5.63	199,641	F	Section of 1885 about 3000′ below the head of the Atchafalaya.
11	44.5	35,160	44.9	84.0	782	5.89	207,184	F	
22	42.5	33,580	42.8	88.0	784	5.45	183,040	F	The gauge readings are those of the Barbre Ldg. standard gauge whose zero is 24.17 feet above the Cairo datum plane.
June... 9	42.4	33,320	42.2	80.0	787	5.90	196,637	M	
13	42.5	33,440	42.1	82.0	793	5.53	184,821	M	
22	42.5	33,060	41.7	82.8	792	5.40	178,676	M	
29	42.2	33,380	42.1	81.0	791	5.50	183,769	M	A local gauge at the section showed a fall between the gauges—distance 3 00 feet—varying from 0′.6 to 0′.4. Observations and reduction under Sec'y M.R.C. Tabulation, Report C. of E.1887, p. 2855.
July... 6	41.6	32,460	42.2	80.2	788	5.60	181,851	M	
11	41.3	32,580	42.1	82 0	790	5.20	169,435	M	
18	40.7	32,260	41.7	82.8	798	5.25	169,444	M	
27	39.8	31,440	42.1	79.8	794	5.27	165,667	M	
Aug. . 3	37.8	29,820	37.8	79.0	788	4.59	136,902	M	Sect. of 1889 about 700 ft. below dam No. 3.
11	31.3	24,900	32.4	71.0	766	4.19	104,417	M	
16	27.8	21,900	33.0	68 0	662	3.63	79,516	M	
22	24.4	19,560	30.0	65.0	651	3.65	71,347	M	
30	20.1	17,530	29.6	60.0	591	2.76	48,297	M	
Sept.... 6	16.6	14,640	25.2	55.6	579	2.31	33,870	M	
14	14.0	13,030	22.7	53.0	572	2.37	30,893	M	
21	13.0	12.500	21.9	51.6	569	2.30	28,761	M	
27	12.7	12,210	21.5	49.5	568	2.35	28,738	M	
Oct.... 2	13 0	12,400	21.6	52.0	572	2.33	28,845	M	c The gauge readings tabulated are those of the Simmsport standard gauge, whose zero is 24.17 feet above the Cairo datum plane. A comparison with the Barbre Ldg. gauge during the observations of 1889 shows a fall of water surface varying from −0′.2 to 1′.46, but a part of the variation was due to difference in the times of reading.
12	9.0	10,440	18.7	48.0	557	1 83	19,104	M	
18	8.7	9,950	17.5	47.1	562	2.00	19,883	M	
24	10.8	10,650	18 8	49 0	565	2.42	25,748	M	
Nov.... 2	11.8	12,390	21.9	51.4	563	2.34	29,038	M	
9	11.5	11,770	20.9	49.5	562	2 28	26,859	M	
16	12.2	11,930	21.1	51.5	563	2.32	27,640	M	
1885.									
Jan ...31	41.5	37,357	43.0	86.0	869	.....	.....	M	
Feb.... 3	41.6	36,564	42.0	84 5	871	5.32	194,416	M	At Simmsport, La., 4 miles below mouth.
6	41.6	37,156	42.7	82.0	870	5.72	212,344	M	
14	39.6	36,054	41.7	83 0	864	4 94	178,204	M	
19	37.8	35,350	41.2	82.0	859	5 30	187,290	M	
26	36.5	33,297	40.0	85 1	833	4 54	151,075	M	
March.10	30.0	27,262	34.7	73.1	786	3.92	106,746	M	
20	32.0	29,753	37.5	75.1	793	4.34	129,200	M	
1889.	c								
Jan....17	20.4	32,625	41.9	67.2	778	2.09	68,226	M	
21	25.0	37,413	46.7	77.0	801	2.83	105,981	M	
24	27.4	39,367	48.1	74.3	819	2.73	107,587	M	
31	31.1	43,191	49.3	79.0	876	.....	.....	M	
Feb.... 2	31 6	43,301	49.2	81.5	880	3.28	141,810	M	
5	31.6	41,746	47.4	75.9	880	.....	.....	M	
8	31.8	40,384	45.7	77.5	883	3.25	131,239	M	
12	32.2	42,119	47.5	78.1	886	3.19	134,198	M	
15	31.9	42,690	48.3	77.6	884	.....	.....	M	
22	28.6	40,695	48.1	77.1	846	2.64	107,247	M	
March. 2	28.1	40,195	47.5	75 8	846	2.76	110,955	M	
7	31.3	42,998	48.9	79.1	880	3.03	132,561	M	
12	32.3	43,818	49.5	80.2	885	3.08	134,973	M	
20	30.8	42,867	50.9	79.8	843	2.92	124,983	M	
22	30.0	42,306	50.4	79.3	839	2.78	117,793	M	
26	28.3	39,776	48.9	77.3	814	2.74	108,776	M	

Observations 1889-93 taken under M. R. C. 4th district officer. Reduction, except L. W. observations of 1892, in the Secretary's office.

ATCHAFALAYA RIVER—*Continued.*

DATE.	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1889.	feet.	sq. ft.	feet.	feet.	feet.	feet.	cu. ft.		
April.. 4	29.0	40,821	49 4	79.0	827	2.81	114,709	M	At Simmsport—cont.
9	28.9	40,155	48.7	77.5	825	2.74	109,882	M	
13	27.8	39,401	48.5	74.7	813	2.64	103,845	M	Tabulation 1889, Rept.
16	27.4	38,739	48.4	74.1	800	2.64	102,475	M	C. of E. 1891, p. 3521.
19	26.6	37,587	47.3	78.1	795	2.42	90,993	M	Report of observations, Ibid. p. 3516.
23	25.2	36,342	46 0	70.3	790	2.25	81,773	M	
26	24.4	36,135	45.9	70.0	788	2.26	81,843	M	
May....14	19.2	32,380	42.1	65.3	769	1.79	57,892	M	
21	16.2	29,847	39.8	61.7	749	1.45	43,220	M	
28	13.0	27,226	38.8	58.0	701	1.32	36,066	M	
1890.									
March. 6	40.3	50,493	55.7	88.1	906	4.31	217,490	M	Section of 1890 and H.
19	42.9	51,339	57.9	92.6	939	4.96	269,609	M	W. of 1891 the same
27	43.0	53,897	57.4	91.6	939	4.91	264,780	M	as in 1889. Tabu-
April.. 7	44.2	57,508	60.6	93.0	949	5.33	306,594	M	lation 1890, Report
10	44.8	58,287	61.4	93.9	950	5.76	335,508	M	C. of E. 1891, p. 3540.
11	44.9	61,880	65.1	102.2	950	6.04	373,742	M	
15	44.9	60,147	63.3	98 6	950	6.68	401,927	M	
17	45.2	59,147	62.1	103.2	953	6.80	402,411	M	
May.... 6	44.8	63,258	66.4	100.0	952	7.48	473,493	M	
8	44.7	63,364	66.6	105.3	951	7.45	472,018	M	
12	44.4	61,291	67.7	105.2	950	7.46	479,908	M	M = meter.
14	44.3	63,889	67.7	109.4	944	7.06	454,927	M	
17	44.1	62,178	65.7	105.0	946	7.03	437,209	M	
19	44.0	63,007	66 7	105.0	944	7.10	447,098	M	
1891.									
March. 9	40.5	59,906	64.5	99.7	929	3.94	235,760	M	
13	41.6	59,364	63.9	104.9	929	4.46	265,083	M	Tabulation, 1891, Re-
17	42.4	60,365	65.5	97.7	921	4.52	272,717	M	port C. of E. 1892 p.
19	42.6	60,067	64.3	100.1	934	4.70	281,995	M	3137 Report on
23	42.8	63,180	67.6	103.9	934	4.69	296,482	M	work, Ibid. p. 3126.
25	42.9	64,323	68.7	104.9	936	4.68	301,000	M	Low water section is
28	42.8	63,584	67.9	105 0	936	4.61	293,244	M	about midway be-
30	43.0	63,218	67.5	106.1	937	4 70	296,996	M	tween dams Nos. 1
April.. 4	43 0	64,103	68.3	105 4	938	4.71	302,113	M	and 3.
6	43.0	64,120	68 4	104.5	938	4.80	307,522	M	
9	43.1	64,452	68.7	106.6	938	4.69	302,555	M	The first section used
11	43.2	63,618	67.8	108.0	938	4.92	313,192	M	in 1892 was also be-
15	43.3	64,314	68.6	105.3	938	4.76	306,075	M	tween dams Nos. 1
17	43.3	63,612	67.8	104.8	938	4.72	300,510	M	and 3. The second
27	43.3	64,407	68.6	108 5	939	4.91	316,030	M	section used from
Oct.....16	0.1	20,175	26.8	39.6	752	0.77	15,599	M	May 13, was below
22	—0.6	20,6.9	28.0	40.9	738	0 81	16,7.5	M	the mouth of Bayou
Nov....20	—1.0	20,154	27.3	38.9	738	0.58	11,641	M	des Glaises and just
1892.									above the mouth of
April.. 1	31.2	48,439	50.9	71.9	951	2.76	133,597	M	Alligator Bayou.
6	32.5	47,810	50.2	72.8	953	2.95	140,882	M	Tabulation H. W.
8	33.1	48,527	50.9	72 6	953	3.04	147,309	M	1892, Report C. of E.
22	38.3	55,377	52.9	79.2	1,046	3.65	202,017	M	1893, p. 3692. Report
May.... 2	41.4	57,485	54.5	80.8	1,055	4.28	245,787	M	on work, Ibid. p. 3680.
7	42.3	58,522	55.4	83.8	1,056	4.48	262,143	M	
†13	43.2	59,433	53.7	85.0	1,050	4.89	275,908	M	The discharge of Al-
20	43.6	59,3:6	56.5	86.8	1,051	5.10	303,049	M	ligator Bayon May
22	43.7	60,275	57.2	87.0	1,053	4.93	296,983	M	13 was 895 cu. feet;
24	43.8	59,647	56.5	86.5	1,055	5.07	302,257	M	May 20, 1681; May
26	43.8	60,407	57.3	87.6	1,055	4.96	299,479	M	21, 2127, June 2, 2739;
28	43 9	59,996	56.9	87.5	1,055	5.11	306,536	M	June 10, 3586; June
June... 2	44.4	61,517	58.2	91.1	1,057	5.25	323,230	M	17, 5006; June 24,
4	44.6	60,586	57.3	90 5	1,057	5.30	320,812	M	6449; June 28, 6351.
6	44.8	60,659	57.4	91.1	1,057	5.41	328,148	M	† New section.
8	45.0	61,227	57.9	91.7	1,057	5.52	337,749	M	
10	45.3	61,356	58 0	90.1	1,057	5.56	341.020	M	
13	45.8	62,452	59.1	91.6	1,057	5.87	366,857	M	
15	46.1	62,964	59.6	91.4	1,057	5 84	367,965	M	
17	46.5	63,770	60.3	92 4	1,057	6.28	400,442	M	
19	46.6	64,207	60.7	94.2	1,057	6.28	403,423	M	
21	46.6	64,026	60.6	92.4	1,057	6 51	416,847	M	
24	46.6	64,320	60.9	92.2	1,057	7 00	450,561	M	
26	46.6	64,532	61.1	91.5	1,057	6.98	450,557	M	
28	.....	63,424	60.0	90.8	1,057	6.80	431,408	M	

ATCHAFALAYA RIVER.—*Continued.*

DATE	Gauge Reading.	Area of Cross Sec'n.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per second.	Discharge per second.	Method.	REMARKS.
1892.	feet.	sq. ft	feet.	feet.	feet.	feet.	cu. ft.		
Oct.... 1	6.4	25,290	.....	.....	.....	.75	18,880	.....	At Simmsport, cont.
2	6.1	25,711	.....	.....	.....	.86	22,138	.....	
3	5 7	25,233	.....	.....	.....	.87	21,957	.....	M = meter.
4	5.2	25,012	.....	.....	.....	.85	21,374	.....	F = double floats.
									R = rod floats.
5	4.8	24,785	.....	.....	.....	.98	24,522	.....	
6	4.4	24,430	.....	.....	.....	.82	20,153	.....	
7	3.9	24,089	.....	.....	.....	.78	18,701	.....	
8	3.5	24,004	.....	.....	.....	.76	18,375	.....	
									Tabulation, L. W. of
10	2.6	22,797	.....	.....	.....	.68	15,584	.....	1892, Report C. of
13	1.8	22,296	.....	.....	.....	.67	14,940	.....	E. 1893, p. 3910.
15	1.6	22,209	.....	.....	.....	.60	13,381	.....	
16	1.6	22,138	.....	.....	.....	.56	12,506	.....	
1893.									
May...‖27	44.3	58,789	57.0	84.5	1,030	4.56	267,776	M	This section was the
‖30	44.4	59,410	57.6	87.5	1,031	4.67	277,375	M	one used from May
June..‖ 2	44.5	59,370	57.5	85 7	1,032	4.79	284.347	M	13, 1892.
‖ 5	44.7	59,354	57.5	86.1	1,033	4.68	278,088	M	
§ 8	45.3	61,652	59.4	87.9	1,038	4.71	290,522	M	Alligator Bayou dis-
									charged May 19, 4487
‖10	45.6	61,754	59.4	87.9	1,039	4.84	298,640	M	cub. feet per second
‖19	47.8	65,878	62.9	94.7	1,047	4.95	326,131	M	June 21, 4963; July
‖21	48.1	64,579	61 7	93 0	1,047	5.23	337,585	M	11, 1057.
July...11	43.9	61,505	59.9	89 9	1,024	4 57	280,577	M	
									§ a. m. ‖ p m.
May...‖30	44.4	60,565	49.6	83.2	1,220	4.66	281,975	M	Section ¼ mile below
June..§ 2	44.5	60,971	50 0	84.5	1,220	4.81	293,372	M	Simmsport.
§ 5	44.8	60,782	49.8	83.8	1,220	4.85	294.648	M	
§ 8	45.3	62,203	51.1	84.6	1,220	4.74	295,013	M	
‖10	45.7	62,766	51.4	85 0	1,220	5.18	325,133	M	
‖14	46.5	64,880	53.2	88 5	1,220	5 06	328,042	M	
‖21	48.0	65,879	53.2	89.5	1,230	5.50	359,244	M	
July..§11	44.0	61,352	50.3	82.1	1,220	4.79	293,881	M	

The gauge tabulated is the M. R. C. standard gauge at Barbre Landing as read by the discharge party. The zero is at the same elevation as that of the Simmsport gauge which had been discontinued viz: 24 17 feet above the Cairo datum plane.

Tabulation 1893, Report C. of E. 1894, p. 2839. Report on work, ibid. p. 2824.

BAYOU DES GLAISES.

[Mouth 4 miles below head of Atchafalaya].

1882.	¶								¶ Barbre Ldg. gauge.
April.. 4	49.3	5,920	18 5	....	320	2.23	13,220	M	

Observation under Secretary of the M. R. C. Report C. of E. 1891, p. 3488.

BAYOU PLAQUEMINE.

[Head 854 miles below Cairo.]

1851.									
April..10	*0 6	5,875	.....	.....	.....	5.67	32,990	F	Near upper mouth.
11	*0.6	5.875	.....	.....	.....	5.88	33,390	F	Tabulation, Hum-
1859.									phreys and Abbot's
Jan....16	†6.2	4,190	....	.....	.....	4.02	16,861	F	Report, p. 603.

* Below H. W. 1851. † Below H. W. 1858.

BAYOU LA FOURCHE.

[Head 885 miles below Cairo.]

1851.									
April..18	*1.2	3,630	.....	.....	.....	2.83	10,275	F	Near upper mouth.
19	*1.2	3,630	.....	.....	.....	2.81	10,200	F	
1859.									
Jan....23	†7.0	2,476	.....	.....	.....	2.08	5,143	F	
27	†4.2	2,961	.....	.....	.....	1.38	4,073	F	At Field's mill.
28	†4.4	2,982	.....	.....	.....	1.43	4,281	F	At Thibodeaux, La.
1884.	‡								
April..13	22 2	3,753	13.8	23.5	271	3.07	11,533	R	5 miles above Thibo-
1890.									deaux.
Feb....21	21.6	4,885	19.2	30 0	255	6.62	32,340	M	At head.

Tabulation, 1851, 1859, in Humphreys and Abbot's Report, p 603.

Observation 1884 under Secretary M. R C. Report C. of E. 1885, p. 2650.

Observation 1890 taken under M. R. C. 4th dist. officer. Reduction in Secretary's office. Report C. of E. 1891, p. 3540.

‡ College Point gauge whose zero is 21.24 feet above the Cairo datum plane.

CREVASSES.

CREVASSES, MISSISSIPPI RIVER.

1876.

LOCALITY.	Distance below Cairo, and bank	Date of observation.	GAUGE.	Area of cross section.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per sec.	Discharge per sec.	Date of occurrence	REMARKS.
	miles.			sq ft.	feet.	feet.	feet.	feet.	cu. feet		
Cubitts Gap	1056 L	Feb.. 7 5 p.m.	Carrollton...10.2	119090					124667		

Coast Survey Report, 1876, p .44. A full review of these observations and a comparison with those of 1868 and 1875, by Prof. Henry Mitchell, in Report C. of E. 1883, p. 2502.

1882, 1883.

Overflow and crevasse measurements taken under direction of the Secretary M R. C. are fully reported and tabulated in Report C. of E. 1885, pp. 2575-2635. The results are not reprinted here as they were mainly estimated; the overflow in the valley was too general to admit of good observations.

1884.

Morganza	790	R	March 25	31880			1902	6.62	211109	March...14
Waterloo	805	R	25	6280			814	7.31	45506	23
Belle Air	823	R	25	1620			255	8.60	13932	18
Guidry's No. 1	942	R	26	160			40	4.30	688	25
" No. 2	943	R	26	525			150	5 16	2709	25
Davis	902	R	27				557	12.9	140156	15

Observations taken under direction of the Secretary M. R. C. Tabulation, Report C. of E 1885, p. 2648. Other overflow and crevasse measurements above Red River Landing are published with field reports, Ibid. pp. 2636-2650. The latter are not reprinted here for same reason given above concerning 1882-3.

1890.

Austin	289	L	April.. 8	9350		49	270	4.00	37370	April.... 1	2d district officer, Report C. of E. 1892, p. 3144.
Brooksfield Opossom Fork Levee		R	19	6404			590	4.00	25622	March...27	Max'm disc. Apr. 8= 38000 cu. ft.
Boggy Bayou	426	R	19	10860			273	2.44	26489	April.... 5	" Apr. 9= 44000 "
Sappington	429	R	17	5118			620	3.58	18321	March... 9	" Mar.12= 35000 "
Ferguson	426	R	17	3468			320	4.03	13987	27	" Mar.31= 17000 "
Chicot	431.5	R	17	1700			240	4.85	8241	27	" Mar.27= 10000 "
Between Chicot and Ark. City	433	R	March.25	2180			354	5.84	14483	24	" Mar.26= 17000 "
" " " "			April..17	3016			390	— 0.95	— 2901	24	Com'ced flowing into river Mar.28
Drainage openings and crevasses between Ark. City and Trippe.			7-8	111013			16180	1.24	187500		Max. disc. Apr. 10 =148600cu.ft.
" " " "			9-10	111266			16190	1.34	148591		
" " " "			14-16	106162			15000	1.32	140558		

CREVASSES, MISSISSIPPI RIVER.

1890.—Continued.

LOCALITY.	Distance below Cairo, and bank	Date of observation.	GAUGE.	Area of cross section.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per sec.	Discharge per sec.	Date of occurrence	REMARKS.
	miles.			sq. ft.	feet.	feet.	feet.	feet.	cu. feet.		
Catfish	432 L	April.. 6		36257			1718	5.73	207851	April.... 4	
"		11		43281			1969	4.72	204500	4	Max. disc. Apr. 6 =208000 cu.ft.
"		13		43011			1969	4.72	203173	4	
Lower side of Catfish	431 L	11-13		51980			3097	— 2.09	—108647	.4-5	Flowing into river. Max'm dis.
" " "	432 L			54632			3428	— 2.09	—114000	.....	Apr. 21 = 114000 cu. ft.
Easton	435.2 L	April.. 4		41000			750	1.35	55296	March...28	Max. disc. Apr. 13 = 68000 cu.ft.
"		11		41000			776	1.43	58752	23	Area of section sounded below
"		13		41000			780	1.65	67650	28	crevasse = 29739 sq. ft.
											Above crevasse = 21581 sq. ft.
Huntington	438.5 L	10		24789			625	4.46	110513	28	Max. disc. Apr. 1 = 125000 cu.ft.
"		11		23099			625	4.31	99513	28	Commenced flowing into river
"		13		21576			625	4 36	93244	28	April 1.
Offutt's	444.5 L	15		37467			860	— 0.37	—13692	18	Max. disc. Mar. 21 = 35000 cu.ft.
											Flowing into river after Apr. 1.
Luna	467 R	March.19		2975			425	10 4	30940	18	
"		22		3850			550	8.0	30800	7 a.m.	
"		25		4062			625	7.2	29246	.....	
"		26		4095			630	7.2	29484	.....	
"		April.. 1		4380			730	6 0	26280	.....	
"		4		4125			750	6.0	24744	.....	
"		5		4180			760	5 6	23408	.....	
"		7		3800			760	5.2	19760	.....	Maximum discharge March 19.
"		8		3800			760	4.8	18240	.....	= 31000 cu. ft.
"		9		3825			765	4.8	18360	.....	
"		10		3825			765	4.4	16829	.....	
"		11		3850			770	4 4	16940	.....	
"		12		3850			770	4 0	15400	.....	
"		14		3875			775	3.5	13640	.....	
"		15		3720			775	3.4	12499	.....	
Columbia and Point Chicot	470 R	March.31		25725			5600	1.28	33034	March...28	
" " "		April.. 3		26905			5850	1.31	35214	.....4 a. m.	
" " "		4		27655			5850	1.24	34402	.....	
" " "		5		26480			5850	1.21	31924	.....	Max. disc. Apr. 3 = 35200 cu. ft.
" " "		7		26130			5850	1.27	33144	.....	
" " "		11		25710			5850	1.11	28515	.....	
" " "		14		24170			5850	1 01	24464	.....	
" " "		15		25380			5850	0.98	24947	.....	
Point Chicot	472 R	March 12		6615			2940	0.92	6055	March... 7	

Miller's Bend	474	L							800			April 7		Discharging into river. Maximum discharge Apr. 15 = 10000 cubic feet (estimated.)
Skipwith's	580	L	April 2	Lake Prov.	39.5	34118			1020	1.87	63704	March 26		
"			5	" "	39 3	39523			1100	2 10	82870			
"			9	" "	39.3	39684			1210	1 88	74480			
"			14	" "	39.3	40124			1240	1.92	77648			
"			16	" "	39.3	41875			1240	1.77	74188			Results of recomputation in the Secretary's office.
"			19	" "	39 3	41014			1240	1 55	63477			
"			21	" "	39 4	42508			1260	1.67	70054			
"			28	" "	38.7	42210			1260	1.52	64210			
"			May 1	" "	38.3	39970			1260	1.06	42467			
"			6	" "	37.9	38728			1260	1 00	38566			
Lake Concordia	692	R	10			11174			887	4.21	47042	April 22		
Arnauldia	701½	R	11			7101			455	1 70	1871	23		
Henderson-Ashley	711½	R	12			6788			873	5.00	38916	23		
Raccourci	770	R	22			1254			380	4.82	5417	23		Closed May 28.
Upper Morganza	788½	R	22			6320			790	5 00	31600	21		
New Morganza	789½	R	23			35357			2142	4.58	146064	22		
Sneed	792½	R	22			533			147	6.00	3139	21		
Lanaux	792½	R	22			453			151	6 72	3044	21		
Fanny Riche	794½	R	22			6228			845	4 85	27118	21		
Preston	801½	R	28			980			218			21		
Taylor No. 1	802½	R	28			690			208			20		Closed May 17.
Taylor No 2	806½	R	23			189			51			20	"	" 11.
Point Manoir	809	R	23			1610			571			30	"	" 11.
Lobdell	816½	R	23			14503			1981	4 12	58892	22	"	" 17.
Martinez	842½	L	28			2443			124			22	"	April 28.
Nita	899	L	23			43780			2892	9.28	402556	March 14		
Corinne No. 1	973½	L							25			Feb. 13	"	Feb. 15.
" No. 2	973½	L							30			March 26	"	March 26.
" No 3	973½	L							25			23	"	" 26.
Bertranville	990½	L							15			Feb. 23	"	Feb. 23.
Live Oak	991½	R	March 26			754			116	7.75	5881	March 20	"	April 10.
Woodland	992½	L							10			22	"	March 23.
Myrtle Grove No. 1	999½	R	May 6			2970			540	2.18	6474	21		
" " No. 2	999½	R	6			1032			295	5.00	5153	21		
St. Sophie No. 1	1000½	L							75			Feb. 18	"	Feb. 15.
" No. 2	1000½	L							70			March 4	"	March 10.
" No. 3	1000½	L							15			7	"	" 9.
" No. 4	1000½	L	April 23			648			54	10.0	6480	April 21	"	April 30.
" No. 5	1000½	L	23			198			22	10.0	1980	21	"	" 30.
" No 6	1000½	L	23			639			71	10.0	6390	21	"	" 30.
" No. 7	1000½	L	23			300			50	10.0	3000	21	"	" 30.
" No. 8	1000½	L	23			105			21	10.0	1050	21	"	" 30.
" No. 9	1000½	L	23			220			40	10.0	2200	21	"	" 30.
" No. 10	1000½	L	23			181			38	9.42	1705	21	"	" 30.
Harlem No. 1	1003½	L	March 23			400			50	10.78	4812	March 21	"	March 25.

Results, Brooksfield to Miller's Bend, inclusive, from reduction at office of third district engineer. Lake Concordia to Harlem, from reduction at office of fourth district engineer. Tabulation of crevasse measurements, 3rd and 4th districts, 1890, Report C. of E. 1891, pp. 3543-6.

CREVASSES, MISSISSIPPI RIVER.

1891.

LOCALITY.	Distance below Cairo, and bank	Date of observation.	GAUGE.	Area of cross section.	DEPTHS. Mean.	DEPTHS. Maximum.	Width.	Mean velocity per sec.	Discharge per sec.	Date of occurrence	REMARKS.
	miles.			sq. ft.	feet.	feet.	feet.	feet.	cu. feet.		
Robertsonville, Miss.	354 L	April..14	Helena.....44.0	23452	42.6	58.5	550	2 62	61317	.....	
	.....	.....	.....	.....	.....	.....	.....	2.66	62412	.....	
Concord, Miss	550 L	18	Lake Prov...40.1	15050	8.1	.....	1980	6.4	100192	March...21	

Observations at Robertsonville, Miss., under M R. C. 2nd district officer. Reduction in Secretary's office. Tabulation, Report C. of E. 1892, page 3131. Report on work, ibid. pp. 3119, 3123.

Observation and reduction of Concord, under M. R. C. 3rd district officer. Tabulation, Report C. of E. 1892, p. 3135.

1892.

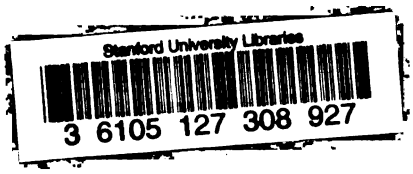
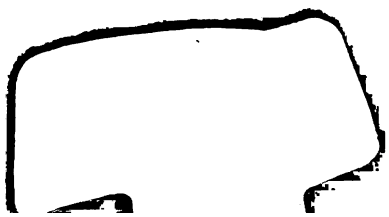
[1]Between Ark. City and Trippe, Ark.	.....	May 28,29 30,31	Ark. City...49.8 ‘‘ ...49.9	200540 198001	.....	.....	16542 12738	1.54 1.55	309000 261000	....	Overflow from crevasses in Arkansas River levee.
Fulton Lake	439 R	June... 8	‘‘ ...49.5	.....	.....	.....	1666	.....	14988	June..... 2	Observations and reduction, Fulton Lake to Brooks Mill, by M. R. C. 3rd district officer.
‘‘	.....	18	‘‘ ...49.3	.....	.....	.....	1809	.....	15960	.....	
‘‘	.....	22	‘‘ ...48.8	.....	.....	.....	1922	.....	19554	.....	
Panther Forest	452 R	May. ..17	‘‘ ...49.2	.....	.....	.....	1091	.....	74214	May..... 18	
‘‘	.....	25	‘‘ ...49.6	.....	.....	.....	1410	.....	69550	.....	
‘‘	.....	June... 2	‘‘ ...49.9	.....	.....	.....	1678	.....	80884	.....	[2] See also Amos Bayou, p. 147, for other years.
‘‘	.....	17	‘‘ ...49.4	.....	.....	.....	2085	.....	91623	.....	
Columbia	470 R	25	Greenville..42.2	.....	.....	.....	880	.....	18488	June.....23	
Leland	484 R	1	‘‘ ..44.2	.....	.....	.....	812	.....	9800	May.....25	
‘‘	.....	16	‘‘ ..43.6	.....	.....	.....	423	.....	17253	.....	
‘‘	.....	25	‘‘ ..42.2	.....	.....	.....	423	.....	6935	.....	
Brooks Mill	506 R	May... 18	‘‘ ..43.9	.....	.....	.....	668	.....	35000	May..... 9	
‘‘	.....	June... 9	‘‘ ..43.7	.....	.....	.....	715	.....	87331	.....	
‘‘	.....	24	‘‘ ..42.5	.....	.....	.....	715	.....	80093	.....	
									Approx'te max. disc.		Date of closure.
Ascension	882.5 R	.....	.....	.....	.....	.....	148	.....	17200	June..... 6	June..... 9
Hermitage	886.5 L	.....	.....	.....	.....	.....	63	.....	9500	21	23
New Hope	897 R	.....	.....	.....	.....	.....	160	.....	19100	1	6
Delogny	906.5 R	.....	.....	.....	.....	.....	196	.....	16400	23	28
Belmont	908 L	.....	.....	.....	.....	.....	1427	.....	139846	12	.....
Tessier	909.75 L	.....	.....	.....	.....	.....	204	.....	25690	May.....22	May.. ...29
Anchor	929.6 L	.....	.....	.....	.....	.....	396	.....	21000	6	.....
Sarpy	937 L	.....	.....	.....	.....	.....	1380	.....	115920	June.....13	.....
Avondale	952 R	.....	.....	.....	.....	.....	139	.....	16120	18	June.....19
Villere No. 1	972 L	.....	.....	.....	.....	.....	15	.....	742	May..... 3	May.. ... 4
‘‘ No. 2	971.9 L	.....	.....	.....	.....	.....	194	.....	1816	June.....11	.....
Story No 1	975 L	.....	.....	.....	.....	.....	23	.....	952	May.....28	30
‘‘ No. 2	974.75 L	.....	.....	.....	.....	.....	114	.....	16560	June.....11	....

Merritt	976 5	L						96		13500	June....18	June....19
Belle Chasse	982.5	R						107		14186	8	15
Cedar Grove	989.5	R						26		686	May.....24	May.....26
Belair	995	L						62		8700	24	28
Monsecour No. 1	998 9	L						24		2100	11	May.....11
" No. 2	999	L						26		2280	29	June..... 4
Happy Point	998	L						51		6750	18	May.....28
Monsecour No. 3	999.1	L						37		2785	June..... 7	June.....18
* Harlem	1002	L						441		22050	May... 12	May.....15
	1003.2	L									to June10	to July.. 1
Miller	1011.7	L						89		5985		June.....14
Octave	1012.0	L						85		5600		May.....14
Martin	1013.5	L						194		3492		July 2

Observations and reduction, Ascension to Martin, by M. R. C. 4th district officer.
The results for 1892 are published in Report C of E. 1893, pp. 3701-2; also for the fourth district, with additional levee data, ibid. p. 3848.
* In a distance of 6000 feet there were 11 breaks at Harlem, and figures presented are aggregates.

1893.

Lakeport, Ark	497	R	May..13	Greenville	43.8	11843			618	5.47	64726	May.. ...11	Observations and reduction by M. R. C. 3rd district officer. Tabulation, Report C. of E. 1894, p. 2844.
			19	"	44.0	19425	6.8		803	4.39	85238	11	
			June.10	"	43.2	20154	16.0		1259	3.44	69493	11	
Keigers	505	R	May..20	"	44.0	10430	14.7		889	1.43	14871	14	
			June. 9	"	43.3	14373	16.6		774	3.28	47093	14	
			May..20	"	44.0	10040	10.1		989	4.12	41428	15	
Grand Lake, (Matthews Bend, two openings)	508	R	20	"	44.0	5500	9.8		560	3.32	18285	15	
			June. 9	"	43.3	14194	8.4		1672	1.73	24469	15	
			9	"	43.3	5102	7.8		552	2.76	14115	15	
Wylys	545	R	May..26	Lake Prov.	40.2						209010	23	
			29	"	39.9				2950		230196		

Estimated maximum discharges of 7 crevasses in the fourth district, 1893, are published by Capt. Millis, in Report C. of E. 1894, p. 3015.

SHELF BINDER
Syracuse, N. Y.
Stockton, Calif.